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THE PLANT DISEASE REPORTER

Issued By

THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

AGRICULTURAL RESEARCH ADMINISTRATION

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY
DIVISION OF MYCOLOGY AND DISEASE SURVEY

Plant Industry Station — Beltsville, Maryland
Volume 30 — December 15, 1946 — Number 12

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RELATION OF SPINDLE TUBER AND LEAF ROLL TO PERCENTAGE REDUCTION IN YIELD OF IRISH POTATOES AS AN AID IN PLANT-DISEASE-SURVEY PRACTICE[1]

E. L. LeClerg, P. M. Lombard, A. H. Eddins, H. T. Cook, and J. C. Campbell[2]

It is generally recognized that records of the extent of crop losses due to diseases are important, but that the estimates of losses are not very accurate and too frequently vary markedly from the actual losses sustained. Since this type of work is fundamental to the ultimate usefulness of plant-disease surveys, it is imperative that means of more adequate evaluation of disease losses should be devised.

Studies dealing with the disease losses associated with definite intensities of disease for different varieties and locations would contribute much to greater efficiency and economic accuracy in plant-disease surveys. Therefore, the present study was made to determine percentage reduction in yield of Irish potatoes caused by different intensities of spindle tuber and leaf roll.

METHODS AND MATERIALS

The data on the effect of different amounts of spindle tuber and leaf roll on yields of Irish potatoes as recently presented by LeClerg, et al[3], have been used as a basis for estimating the percentage losses caused by these diseases.

Statistical analyses of the different experiments demonstrated a linear relationship between percentage incidence of disease and yield of marketable tubers (grade No. 1). Accordingly, calculated yields at each level of disease were determined for each experiment.

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[1] Cooperative investigation by the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture, and the Agricultural Experiment Stations of Alabama, Florida, Louisiana, Maine, New Jersey, and Virginia.

[2] Pathologist and Horticulturist of the U. S. Department of Agriculture, Plant Pathologist of the Florida Agricultural Experiment Station, Plant Pathologist of the Virginia Truck Experiment Station, and Research Associate in Agriculture of the New Jersey Agricultural Experiment Station, respectively.

[3] LeClerg, E. L., P. M. Lombard, A. H. Eddins, H. T. Cook, and J. C. Campbell. Effect of different amounts of spindle tuber and leaf roll on yields of Irish Potatoes. Amer. Potato Jour. 21:60-71. 1944.

Table 1. Calculated percentage reduction in yield of No. 1 tubers of Irish potatoes due to different amounts of spindle tuber.

State	Year	Percentage of infected plants and corresponding percentage reduction in yield						
		4	8	12	16	24	32	100
					Katahdin			
Florida	1940	0.7	1.3	2.3	3.9	4.2	5.5	16.8
	1941	1.7	2.6	4.3	5.9	8.5	11.0	34.8
	1942	1.0	1.5	2.4	2.9	4.4	5.8	18.9
	Average	1.1	1.8	3.0	4.2	5.7	7.4	23.5
Louisiana	1940	2.3	4.6	6.9	9.2	13.1	17.7	55.4
	1941	1.6	3.3	5.4	7.1	10.4	14.1	45.0
	1942	1.2	3.0	4.2	6.0	9.0	12.1	37.4
	Average	1.7	3.6	5.5	7.4	10.8	14.6	45.9
Maine	1940	2.1	4.3	6.6	8.8	13.5	17.9	55.8
	1941	1.6	2.9	4.3	5.8	8.5	11.4	35.4
	1942	2.1	4.1	6.2	8.0	12.1	16.2	51.0
	Average	1.9	3.8	5.7	7.5	11.4	15.2	47.4
Variety Average		1.6	3.1	4.7	6.4	9.3	12.4	38.9
					Irish Cobbler			
Maine	1940	2.9	5.4	8.0	10.4	16.0	21.0	66.0
	1942	1.9	4.7	5.4	7.1	11.6	14.1	43.8
	Average	2.4	5.0	6.7	8.8	13.8	17.6	54.9
New Jersey	1940	2.8	5.5	8.3	11.0	16.5	23.0	68.4
	1942	2.7	5.4	7.7	10.5	15.5	20.9	65.1
	Average	2.7	5.4	8.0	10.7	16.0	21.9	66.7
Virginia	1940	2.7	5.5	8.2	10.9	16.4	21.8	67.9
	1942	2.3	4.6	7.0	9.2	13.9	18.6	57.0
	Average	2.5	5.0	7.6	10.0	15.2	20.2	62.4
Variety Average		2.6	5.2	7.4	9.8	15.0	19.9	61.4
					Chippewa			
Maine	1940	0.5	1.2	1.7	2.4	3.7	5.1	15.8
	1941	1.6	3.4	4.9	6.7	10.0	13.4	41.6
Variety Average		1.0	2.3	3.3	4.6	6.8	9.2	28.7
					Green Mountain			
Maine	1940	3.2	6.2	9.5	12.5	19.0	25.2	78.1
	1941	1.0	2.1	3.1	4.0	6.1	8.2	25.5
	1942	1.8	3.6	5.1	6.9	10.4	14.0	43.3
Variety Average		2.0	4.0	5.9	7.8	11.8	15.8	49.0
					Triumph			
Alabama	1940	2.2	4.4	6.5	8.7	13.8	18.1	56.5
	1941	2.2	4.4	6.6	8.8	12.6	17.0	53.0
	Average	2.2	4.4	6.6	8.8	13.2	17.6	54.7
Louisiana	1941	1.7	2.6	4.3	5.9	8.5	11.0	34.8
	1942	2.6	5.1	7.7	9.0	14.1	19.2	61.5
	Average	2.2	3.8	6.0	7.4	11.3	15.1	48.2
Maine	1941	1.3	2.9	4.3	5.9	8.8	11.8	36.6
	1942	2.3	4.3	6.6	8.6	12.9	17.2	53.4
	Average	1.8	3.6	5.4	7.2	10.8	14.5	45.0
Variety Average		2.0	4.0	6.0	7.8	11.8	15.7	49.3

Table 2. Calculated percentage reduction in yield of No. 1 tubers of Irish potatoes due to different amounts of leaf roll.

State	Year	Percentage of infected plants and corresponding percentage reduction in yield						
		4	8	12	16	24	32	100
					Irish Cobbler			
Maine	1940	1.8	3.9	5.7	7.5	11.4	15.3	48.0
	1942	2.5	5.0	7.3	9.8	14.5	19.3	60.0
	Average	2.2	4.4	6.5	8.6	12.9	17.3	54.0
New Jersey	1940	1.4	2.8	4.6	6.0	9.2	12.4	38.7
	1941	2.9	5.4	7.9	10.5	15.6	21.0	65.0
	1942	1.2	2.9	4.5	5.7	9.0	11.8	37.6
	Average	1.8	3.7	5.7	7.4	11.3	15.1	47.1
Virginia	1940	2.3	4.1	6.0	8.1	11.9	16.0	49.8
	1941	2.4	4.8	7.2	9.6	14.3	19.1	54.8
	1942	1.2	3.6	4.8	7.2	10.8	14.3	44.1
	Average	2.0	4.2	6.0	8.3	12.3	16.5	49.6
Variety Average		2.0	3.1	6.1	8.2	12.2	16.3	50.2
					Katahdin			
Florida	1940	2.5	4.9	7.3	9.9	14.8	19.4	60.9
	1941	3.1	5.1	8.2	10.2	15.3	20.4	63.3
	1942	2.4	5.4	7.8	10.2	15.1	20.5	63.4
	Average	2.7	5.1	7.8	10.1	15.1	20.1	62.5
Louisiana	1940	1.9	3.8	5.8	7.8	11.7	15.5	48.6
	1941	1.7	3.4	5.1	7.3	10.7	15.0	45.0
	1942	1.3	4.0	6.0	8.7	12.7	17.3	56.0
	Average	1.6	3.7	5.6	7.9	11.7	15.9	49.9
Maine	1940	2.8	5.7	8.5	11.4	17.0	22.3	70.0
	1942	3.0	5.8	9.1	11.9	17.8	24.0	75.3
	Average	2.9	5.8	8.8	11.6	17.4	23.2	72.6
Variety Average		2.3	4.9	7.4	9.9	14.7	19.7	61.7

Table 3. Rainfall and temperature data for last 3 months of the potato crop season at each location where experiments were made.

Location[a]	Month	Rainfall	Temperature		
			Minimum	Maximum	Average
		Inches	°F	°F	°F
		1940			
Alabama	March	3.25	32	79	59
	April	5.78	29	85	65
	May	.53	46	92	72
Florida	February	3.90	24	79	55
	March	1.89	35	87	62
	April	2.24	36	90	66
Louisiana	March	4.79	31	87	61
	April	7.12	31	87	66
	May	.69	51	90	73
Maine	July	3.41	54	79	66
	August	1.67	49	79	64
	September	4.37	45	67	56
New Jersey	July	1.74	49	100	75
	August	6.61	44	93	69
	September	5.72	35	88	63
Virginia	May	3.80	54	75	65
	June	2.22	64	85	75
	July	3.42	66	87	77
		1941			
Alabama	March	6.87	33	77	55
	April	3.17	47	86	68
	May	2.16	51	93	74
Florida	February	3.65	30	76	53
	March	2.26	27	86	58
	April	3.55	48	89	69
Louisiana	March	5.29	32	78	56
	April	2.99	46	85	69
	May	4.78	55	95	74

Table 3 cont.

Location[a]	Month	Rainfall	Temperature		
			Minimum	Maximum	Average
		Inches	°F	°F	°F
		1941 (cont.)			
Maine	July	3.30	57	82	70
	August	4.53	50	74	62
	September	2.48	43	68	56
New Jersey	July	8.50	54	97	74
	August	3.03	44	94	71
	September	.02	37	95	67
Virginia	May	1.11	58	82	70
	June	1.88	66	86	76
	July	4.13	70	90	80
		1942			
Florida	February	4.33	32	83	54
	March	8.90	32	90	62
	April	.28	40	90	66
Louisiana	March	5.00	36	84	60
	April	10.16	37	86	68
	May	1.76	54	92	75
Maine	July	1.92	52	77	64
	August	4.13	53	76	64
	September	3.11	48	69	58
New Jersey	July	7.32	51	98	75
	August	3.91	45	91	71
	September	3.32	32	92	66
Virginia	May	1.11	45	94	70
	June	1.88	58	97	76
	July	4.31	64	100	80

[a] Locations of plots in States as follows: Fairhope, Ala., Hastings, Fla., Baton Rouge, La., Presque Isle, Maine, Hightstown, N. J., and Onley, Va.

Using the calculated yield values the percentage reduction was determined for each percentage of disease in relation to the calculated yield from the plots with 100 percent healthy plants.

RESULTS AND DISCUSSION

The calculated percentage reductions in yield at each level of spindle tuber and leaf roll for the various experiments are presented in tables 1 and 2. The data were obtained in six States with four varieties for spindle tuber and in five States with two varieties for leaf roll, in all cases at eight different levels of disease (the 100 percent healthy plot being considered as the lowest disease level). The tests were carried on in 1940, 1941, and 1942.

The data indicate that a progressive percentage decrease in yield resulted as the amount of either disease increased. In using these data as a basis for future estimates of losses it is important to note the marked effect of season in most States on percentage reduction of yield. For this reason the data for each year are presented so that anyone using them for estimation purposes may compare them and the monthly climatic data (table 3) existent during any one year of these experiments, with those of the season for which crop losses are being estimated.

The shortcomings of these data are recognized, but it is thought that their presentation may have practical use in helping to arrive at a more accurate estimate of reduction in yield of Irish potatoes as influenced by these two diseases when the percentage of diseased plants is known.

Ordinarily so many factors other than disease operate to cause reduction in yield that it is not possible to relate yield directly to disease losses. Therefore, in attempting to utilize these data one must take into consideration the many factors that influence plant growth and yield. Among the most important factors are time of planting, rate of application and kind of fertilizer, cultural practices employed in caring for the crop, climatic conditions prevalent during growing season, and variety. Even with all the limitations necessary in interpreting the data herein presented, a more accurate value of loss estimate can be made than by "judgments of opinion" as is so commonly practiced.

U. S. BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING, AND AGRICULTURAL EXPERIMENT STATIONS OF ALABAMA, FLORIDA, LOUISIANA, MAINE, NEW JERSEY, AND VIRGINIA

VARIETAL SUSCEPTIBILITY OF BEANS TO XANTHOMONAS PHASEOLI VAR. FUSCANS

Walter H. Burkholder and E. T. Bullard

Since the bacterial blight of beans caused by Xanthomonas phaseoli var. fuscans (Burkh.) Starr and Burkholder has become of common occurrence on the Michelite pea beans in New York State, its possible spread to other varieties of this crop is anticipated. In one instance during the last year it was found on Marrow beans. Furthermore, the symptoms of this disease are not readily distinguishable from the symptoms of the common blight caused by X. phaseoli and the disease may have spread further than we now know. Dr. C. Chupp, in extension literature, is calling this new bacterial disease the "fuscous" blight to differentiate it from the common blight, the halo blight, and the wilt. This name will be used here. With the fuscous blight on the increase in the State a knowledge of the varietal susceptibility of the beans to the disease is of importance in recommending varieties to the growers and for use in the bean breeding program carried on at the Cornell University Agricultural Experiment Station. This need became more evident in the fall of 1945 when the junior author discovered that the variety, Hidatsa Red, a bean extremely resistant to the halo blight caused by Pseudomonas phaseolicola Dowson, is very susceptible to the fuscous blight. Experiments, therefore, were conducted on 40 varieties and strains of field and garden beans which included as far as possible those of the common commercial types. The first series was run in January and February 1946 in a greenhouse, the temperature of which was held at approximately 75° F. Two 6-inch pots of each variety were used containing 2 to 3 plants and all were sprayed 4 times at various intervals with a water suspension of a pure culture of the pathogen. A second series was conducted similarly in July and August and although the temperature varied from day to day it was not far different from that of the first series. Infection was readily obtained by the above inoculations especially on certain varieties and the disease appeared to spread by ordinary greenhouse watering. Another minor series conducted in the spring of 1946 in a greenhouse held at approximately 60-65° F gave poor results, indicating that high temperature is more favorable for the disease.

Data collected from these three series of inoculation experiments are presented in Table 1. Varieties showing X severity had few and minor lesions on the leaves. Plants having XXXX infection had numerous and large lesions covering about 50 percent of the leaf. Two other grades, XX and XXX, vary in intensity between the light and severe infection. Since few pods were formed on most of the varieties of beans under the greenhouse conditions, pod infection was not considered. The most interesting point in the table is the fact that

Table 1. Varietal susceptibility of beans to the fuscous blight

Varieties	Infection
Agron Black Valentine	XXXX
Bountiful	XX
Burpee's Stringless Green Pod	XXX
Decatur	XXXX
Grant Stringless	XX
Great Northern No. 1	X
Hidatsa Red	XXX
Horticultural Cranberry	XX
Kentucky Wonder	XX
Kentucky Wonder Wax	XXX
Keystonia	XXX
King Horticultural	XXX
Lazy Wife	XXX
McCalans	XXXX
Michelite	XXX
New Long Tendergreen	XXX
Norida	X
Pencil Pod Black Wax	XX
Perry Marrow	XXX
Plentiful	XXX
Potomac	XXX
Red Kidney (Market)	XXX
" " Strain 28*	XX
" " " 117*	XXX
Robust pea bean	XX
Round Pod Kidney Wax	XX
Ruby Dwarf Horticultural	XXX
Scarlet Runner	-
Scotia	XXX
Streamliner	XX
Stringless Black Valentine	XXX
Stringless Red Valentine	XXX
Sure Crop Wax	XXX
Sure Crop Stringless Wax	XXX
Tendergreen	XXXX
Tender Pod	XXX
Unrivaled Wax	XXX
White Kidney	XX
White seeded, rust resistant Kentucky Wonder	XXXX
Yellow Eye	XX

* Strains of Red Kidney showing resistance to the halo blight.

Great Northern No. 1, which is resistant to the halo blight pathogen and to the two bean viruses causing the mosaic of beans, also shows resistance to X. phaseoli var. fuscans. While this type of bean is not grown commercially in the east, the variety is valuable for breeding purposes. The Norida, a similar type of bean, is resistant to the fuscous blight but it is susceptible to other diseases, and certain undesirable characters eliminate it as breeding stock. The Scarlet Runner is more resistant to the fuscous blight than the varieties mentioned above, but it is of a different species in the genus Phaseolus, and is not grown commercially nor is it of value in breeding work.

CORNELL UNIVERSITY
ITHACA, NEW YORK

EARLY APPEARANCE OF POTATO LATE BLIGHT ON THE FALL CROP IN FLORIDA

G. R. Townsend

Late blight [Phytophthora infestans] of potatoes has been observed in the fall crop in the Everglades some five or six weeks earlier this year than any previous record. It was first noted on October 22, when scattering lesions were found in a field planted with Bliss Triumph potatoes grown from a Tennessee seed stock. Shortly thereafter it was found in two other fields planted with Tennessee seed, and subsequently in potatoes from North and South Dakota stocks. It has also been found on volunteer potatoes growing from tubers of the spring crop that had remained in the field over-summer. The disease was well advanced on these volunteer potatoes as early as October 24 and appeared to be spreading from them to a nearby planted field of potatoes. This is my first positive identification of volunteer potatoes as carriers of the late blight disease through the summer in Southern Florida, and it may be of importance in explaining the source of the 1945-46 outbreaks on tomatoes and potatoes in this area.

It is of further interest that the disease first appeared when the temperatures were somewhat above the range where late blight would be expected, and there had been little rain for three weeks. Since the first observation the disease has developed destructively in a field where the spray program was faulty and threatens to reach serious proportions in other fields that are inadequately sprayed. Recent weather has been very favorable for a serious outbreak in this area, and the possibility should be of concern to other parts of Florida where tomatoes and potatoes are being grown as winter crops.

BOX 505
BELLE GLADE, FLORIDA

LATE BLIGHT ON POTATO IN 1946

NEW HAMPSHIRE

By M. C. Richards

I cannot give you accurate estimates of losses from late blight in New Hampshire, as no survey of the State was made with respect to this disease. A great many home gardeners lost practically their entire crop due to late blight. Both the vines and tubers were affected. In general, the large potato growers have kept their plants well-covered with fungicides and relatively few have lost any of the tubers from tuber rot. The largest yield of potatoes in the history of the State are now being dug. Some of these may show rot in storage, although a considerable number of the growers have attempted this year to kill the vines before digging to prevent infection. DDT has done a good job in maintaining the vines in a vigorous growing conditions until late in the season.

Potato growers used in most cases Bordeaux mixture or neutral copper fungicides. Most of the newer organic fungicides were not used by potato or tomato growers in the State. Where an efficient job of either spraying or dusting was carried out, effective control of late blight was obtained by both methods. On potatoes in commercial fields I would say that 100 percent of the growers used control measures.

There are always numerous centers of inoculation. Because of the wet, cool weather in August, there was a widespread movement of spores from these centers to unprotected plants. The incidence of disease in the State this year could definitely be associated with the weather.

As far as we could observe, there were no differences with respect to infection on potato varieties, except for four blight-resistant strains which we obtained from New York State. These still showed no infection up to a week ago, while the check plots neighboring these had been dead for six weeks.

UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NEW HAMPSHIRE. OCTOBER 14.

MARYLAND

By R. A. Jehle, F. C. Stark, and C. E. Cox

As reported on June 18, 1946, late blight appeared on the early crop of potatoes on the Eastern Shore of Maryland as early as June 4. At least a trace was found in every field visited and in favored locations 100 percent of the plants were infected. At digging time tuber infection was very light and losses were not severe in the early crop. Losses were negligible in fields sprayed or dusted with copper compounds.

In Western Maryland where only one crop of potatoes a year is grown, there was a severe drought. No late blight has been found and none has been reported on potatoes in this area. For the most part growers in Western Maryland follow a regular spraying or dusting program each year.

Late blight was found in August in every field of late crop potatoes that was visited on the Eastern Shore. The late crop is planted in early July. Conditions in the field paralleled those on the early crop. The late crop has not yet been dug, but recent cool, wet weather will favor further development of the disease. If weather conditions continue to be favorable for the disease serious losses from tuber rot are anticipated when the crop is dug in late October. While most commercial growers spray the late crop potatoes, the practice is by no means universal.

UNIVERSITY OF MARYLAND
COLLEGE PARK, MARYLAND

WEST VIRGINIA

H. L. Barnett

The following information regarding late blight in West Virginia during the past season was furnished by Mr. C. F. Bishop and Mr. J. R. Vaughn.

On potatoes the late blight situation changed little during the summer since the earlier report. The disease was checked in most areas when dry weather came. Early varieties suffered heavier losses than in previous years. In the larger potato growing areas it is customary to spray the late varieties and as usual, the loss this year was not heavy.

WEST VIRGINIA UNIVERSITY
MORGANTOWN, WEST VIRGINIA. OCTOBER 14

WESTERN NORTH CAROLINA

By James H. Jensen

Losses on potatoes for Eastern North Carolina were covered in an earlier report. As far as the late crop is concerned in the mountain area the disease was heavy and undoubtedly served to produce losses through defoliation and also by tuber rot in the field. We are not in possession of estimates on these points however.

The small size of the fields, their location in most cases on sides of mountains, and the difficulties of reaching those fields with anything excepting hand equipment, have served to curtail any extensive amount of attempts to control blight by dusting or spraying.

UNIVERSITY OF NORTH CAROLINA
RALEIGH, NORTH CAROLINA. OCTOBER 30.

INDIANA

By R. W. Samson

Satisfactory estimates of the losses caused by late blight in Indiana in 1946 are difficult to make because of the erratic seasonal and geographic distribution of the disease. Temperatures were generally favorable throughout the season. Rainfall was rather frequent and abundant to about August 1 in the southern half of the State, but definitely deficient from the first of July throughout the rest of the State.

Moderate day-time and frequently low night-time temperatures resulted in many nights with heavy dews; as well as fog banks over low-lying areas. These dew and fog conditions alone did not appear adequqte for severe blight epidemics. Blight epidemics occurred only when the fogs and dews were supplemented by rainy periods.

Very early potato plantings, limited largely to home gardens were severely damaged by blight in early June in southern and eastern Indiana. Severe damage is known to have occurred on late potatoes in some Ohio River counties in late September. Only traces of the disease were noted in the main commercial potato crop grown in northern Indiana muck soils, Most of these were sprayed regularly. An exception was a sizeable potato spraying trial on muck wherein only DDT was applied to duplicate, long, 12-row blocks. Despite almost entire absence of rain during July, August and early September, late blight developed sufficiently in these blocks to reduce yields.

Bordeaux, and a proprietary copper and thiocarbamate fungicide appeared equally effective in controlling the disease in adjacent blocks.

Dry weather subsequent to light (August 29) and killing (September 29) frosts in the muck potato area probably prevented any late blight tuber infection.

PURDUE UNIVERSITY AGRICULTURAL EXPERIMENT STATION
LAFAYETTE, INDIANA. OCTOBER 23

ILLINOIS

By G. H. Boewe

From August 26 to 30, I examined potatoes and tomatoes in the Northern half of the State. No late blight was observed on potatoes.

On October 10, I examined potatoes and tomatoes in Jo Daviess County (northwest corner of the State) and found late blight severe on foliage of Sebago potatoes and stem cankers abundant in severely blighted areas of the planting. There had been very little rain in that area for three weeks and I doubt if tubers had become infected. Tomatoes in a garden near blighted potatoes were severely diseased. The foliage on some plants was almost all killed by late blight and approximately 60 percent of the fruits were infected. The fungus was fruiting abundantly on foliage and fruit of tomatoes and foliage of potatoes.

Loss due to late blight of potato is estimated at 1 percent of the crop or approximately 27,700 bushels. Most of the damage resulted from defoliation and premature killing of the vines. I doubt if very much tuber rot occurred this year.

In southern Illinois where late blight occurred on tomatoes and potatoes in May and June, the progress of the disease was stopped by warm, dry weather of June and July. In the northern part of the State, late blight came in late because of the warm, dry weather in July.

ILLINOIS STATE NATURAL HISTORY SURVEY
URBANA, ILLINOIS. OCTOBER 19

WISCONSIN

By R. E. Vaughan

Late blight in potato fields was very light and did not occur until late in the season.

UNIVERSITY OF WISCONSIN
MADISON. OCTOBER 8

IOWA

By W. F. Buchholtz

Late blight caused a trace of loss on potatoes -- largely from tuber rot in northern Iowa.

On potatoes, Phytophthora infestans struck as crop was maturing. There was not much destruction of foliage except on very late potatoes, but some tuber rot resulted.

Commercial potatoes in northern Iowa were sprayed with Bordeaux, but not quite often enough to completely control Phytophthora infestans. Seventy-five percent of the commercial potato growers used fungicides.

[See also the report by Coe & Hooker , p.462].

Late blight was observed on potatoes after it had been found in abundance on tomatoes!
IOWA STATE COLLEGE
AMES. OCTOBER 21

ARKANSAS

By V. H. Young

We have no reports of late blight on either tomatoes or potatoes and the Plant Board has no record so far as I can find of diseased plants shipped in. In recent years late blight rot has been detected on certified seed potatoes being shipped into the State from Minnesota and North Dakota as I recall it, but except for reports of very minor outbreaks on potatoes some years ago there is no record of the disease. My feeling is that it becomes hot and dry here too early for the disease to obtain foothold.
UNIVERSITY OF ARKANSAS
FAYETTEVILLE. OCTOBER 11

NEBRASKA

By Arden F. Sherf

Late blight has not been a problem in Nebraska this year. To date no late blight has appeared on potatoes; however, our late crop is just being harvested so the possibility still exists that we may find it.
UNIVERSITY OF NEBRASKA
LINCOLN. OCTOBER 16

KANSAS

By L. E. Melchers

Late blight was not observed in the 1946 potato crop in Kansas. I doubt if there was any that appeared anywhere in the State.
KANSAS AGRICULTURAL EXPERIMENT STATION
MANHATTAN. OCTOBER 7.

COLORADO

By W. D. Thomas, Jr. and W. J. Henderson

Late blight on potatoes was first found in Colorado this year on July 11 in two fields of early potatoes near Gilcrest, in Weld County. The fields were then heavily infected and it was estimated that the infection had been present for at least ten days. This was the first time the disease had been reported on early potatoes in this State.

Most of the early crop, however, escaped infection, and epidemic proportions were not reached until the maturity of the late crop in September. At that time the weather was characterized by a week of cool, cloudy weather with intermittent misty rains.

Upon discovery of the first infection spray demonstrations were set up in Weld and Morgan Counties, and newspaper and radio warnings were released. Approximately 95 percent of the growers in this area either sprayed or dusted, the sprays giving the best control. A few growers dusted by airplane and they believed this method to be effective, since their vines were so heavy they couldn't get into the fields with tractors.

In anticipation of further blight infections next year the growers are now making plans to resume their spray and dust programs. Also, tests of chemical materials are being planned by the Experiment Station, with special consideration of adding copper to irrigation water.

Although it is yet too early for a final estimate, it seems likely that field losses due to late blight were as high as 10 percent in Weld County and 2 percent in Morgan County, lower than those of 1945 due mainly to the accelerated control program.

Cull piles had been destroyed throughout the State, thus eliminating that source of inoculum. All available evidence indicates that the original source of infection was diseased potato seed produced either locally or in the North Central States. It appears that wind was responsible for disseminating the inoculum since infections were

found thinning out in fields at least one mile from heavily infected loci.

Favorable weather for the growth of the organism varied considerably during the season. However, since early infection was heavy in the caulms, the organism was able to survive in the fields through the intermittent dry periods.

COLORADO A & M COLLEGE
FORT COLLINS. OCTOBER 17

WASHINGTON

By M. R. Harris

Losses in this State were small and to my knowledge only three cars of potatoes were discarded because of late blight tuber infection. There was in the Yakima Valley a considerable amount of blight this year. Since this disease had not been reported in that Valley prior to this year, there was considerable speculation among the growers as to the exact nature of the disease. Late in the season I was able to make a scant survey of the area and discovered infection in many of the fields, occurring in circular spots varying in diameter from 10 to 100 feet. There was every indication that the infection came from diseased seed pieces.

No control measures were taken in the Yakima Valley for two reasons. First, growers were not familiar with the disease and second, they did not possess equipment adequate to undertake control measures. In a few cases dusting was resorted to but this was largely for control of insects with some copper included in the dust.

As to results I would say that the late blight was not retarded in its spread to any appreciable degree. Climatic factors were such that while the disease did occur, it did not spread consistently and was able to increase the amount of infection during only a few periods in the season. Airplane dusting was the only method used to apply dust; and as mentioned before did not prove to be very effective.

Concerning the percentage of growers in the State who attempted control measures, I should say there were very few. As to what will be done next year, there does not appear to be any great activity in acquiring spraying material or planning on dusting. Potatoes have passed from a wartime crop to one in which there is a surplus and it is probable that many growers will reduce their potato acreage or eliminate it next year. With a drop in prices they are not interested in a control measure, which at best may not be needed and might do little good if it were.

There did not appear to be any spread of the disease in general except for a few wet periods through the season. Dissemination took place mainly from an original diseased plant and spread slightly from that source. The weather was a very definite factor in holding down the disease.

Concerning varietal reactions, I was able to observe the disease only on White Rose and Netted Gem. Of these two the White Rose was definitely more severely damaged. However, the disease does spread on Netted Gem and could be quite destructive if environmental conditions were favorable.
STATE COLLEGE OF WASHINGTON
PULLMAN. OCTOBER 16

OREGON

By C. E. Owens

There was no appreciable damage from late blight of potato in most parts of Oregon during the season of 1946.

In certain coastal counties some small plantings showed considerable damage, -- the usual case in this region.
OREGON STATE COLLEGE
CORVALLS. OCTOBER 24

LATE BLIGHT ON TOMATO IN MICHIGAN

Ray Nelson

Because of the exceptionally dry summer in Michigan late blight was a very minor disease on tomatoes. Very little rain fell from June 15 until October 15. Our accumulated rainfall deficiency for 1946 totals almost 9 inches.

Mrs. M. C. Strong has charge of the tomato disease work in Michigan and I asked her for a report on the late blight situation since she had more opportunities than I to make observations. The following is her brief report:

"Owing to exceptionally dry weather conditions very slight losses were sustained in Michigan from late blight. The loss occurred late in the season on the mature crop and no control measures were applied. The two cases reported were in Wayne and Monroe counties, one in a truck garden near Detroit, the other in a commercial canners field near Ida."

In the northern part of the southern peninsula more rain fell but tomatoes are not grown commercially in those sections. We have no information on the disease in the northern areas in home gardens but I doubt very much that it occurs to any extent since rainfall in those sections was also far below normal. Even dews, normally heavy in Michigan, were absent this year. As an example of the difference between 1945 and 1946 onion mildew which caused very serious losses in the Michigan crop in 1945 was not observed in 1946.

MICHIGAN STATE COLLEGE
EAST LANSING. NOVEMBER 8

NOTES ON SOME VEGETABLE DISEASES IN NORTH CAROLINA IN 1946

D. E. Ellis and R. S. Cox

LETTUCE Damping-off: During January and February post-emergence damping-off in lettuce plant beds was more severe than it had been for several years. The effectiveness of the Fermate drench[1]* in reducing damping off undoubtedly averted a plant shortage in some communities. Isolation and inoculation studies showed that Rhizoctonia solani Kuehn was primarily responsible for the disease. Pythiaceous fungi were also encountered but were more frequently associated with root rot than with typical post-emergence damping-off. In inoculation tests Pythium debaryanum Hesse and P. spinosum Sawada[2] as well as one or more yet undetermined species, caused pre-emergence damping-off and root rot but not typical post-emergence damping-off. So far as the writers have been able to determine P. spinosum has not hitherto been reported on lettuce in America. Sclerotinia was infrequently encountered but caused some losses in plant beds during periods of unseasonably warm weather.

Downy mildew: (Bremia lactucae Reg.) was widespread and caused considerable damage just prior to harvest in the Pender-New Hanover county lettuce area. All varieties commonly grown in the area were affected, including several of the Imperial strains. The writers have not observed this disease in North Carolina for the past several years, either in the plant bed or field. While its sudden appearance in near epiphytotic proportions may have been largely a result of favorable weather conditions, the possibility of a new race of the organism is suggested.

Big Vein (virus) was generally distributed in the lettuce area in April. It was particularly prevalent on the Iceberg varieties and on Romaine. These varieties showed from trace amounts to as high as 40 percent infection.

Drop (Sclerotinia sp.) was more prevalent than usual and caused an estimated average loss of 3 percent, with losses in some fields as high as 10 percent.

Root Knot (Heterodera marioni (Cornu) Goodey), which is usually not a problem on the spring lettuce crop, caused an estimated loss of about 15 percent in each of two fields in New Hanover County. In both cases the fields were cropped to susceptible soybeans the previous year.

CUCURBITS Angular leafspot (Bacterium lachrymans E.F.Sm. & Bryan) [Pseudomonas] caused an estimated loss of 20 percent to the fresh market cucumber crop in Sampson, Pender, Duplin, and New Hanover Counties. Apparently nearly all seed lots planted were

*Footnotes on page 460

heavily infected and weather conditions in May and early June were especially favorable for secondary spread. In a dusting test at Willard, the percentage of culls due to fruit infection was substantially reduced by Zerlate and fixed copper dusts.

Downy mildew (Peronoplasmopara cubensis Berk. & Curt.) [Pseudoperonospora] was first observed in Scotland County on May 28, about 2 to 3 weeks earlier than usual. The disease was epiphytotic on cucurbits throughout most of Eastern North Carolina and caused losses estimated as follows: cucumbers for fresh-market, 30 percent; cucumbers for processing, 35 percent; cantaloups, 20 percent; watermelon, 10 percent. In the dusting test at Willard, referred to above, the use of 5 percent fixed copper and 10 percent Zerlate dusts resulted in increases of nearly 100 percent in yield of marketable fruit. Fermate dust was less effective.

A disease tentatively determined, on the basis of symptoms and the pycnidial stage, as Mycosphaerella wilt (M. citrullina (C.O.Sm.) Gross.) caused considerable defoliation of watermelon plantings in Wake and Chowan Counties in July.

TOMATO In addition to late blight (mentioned in previous reports) the most important tomato diseases observed were Buckeye rot (Phytophthora terrestris Sherb.) [P. parasitica], Bacterial wilt (Bacterium solanacearum E.F.Sm.) [Pseudomonas], Fusarium wilt (F. bulbigenum var. lycopersici (Brushi) Wr. & Reinking)[F. oxysporum f. lycopersici], and early blight (Alternaria solani (Ell. & Mart.) Jones & Grout).

In June a stem disease, not previously observed by the writers, was found affecting several common varieties in test plots at McCullers. Affected plants, which had been set in the field for about 30 days, wilted rather suddenly and soon died. The stem at the soil line was somewhat constricted and the cortical tissues were killed. In the majority of cases the pith was soft and disintegrated and in the advanced stages the stem was hollow. In a limited number of isolations Rhizoctonia solani and a bacterium, tentatively determined as B. carotovorus Jones [Erwinia carotovora] were recovered from a high percentage of the affected tissues plated.

LIMA BEAN Stem anthracnose (Colletotrichum truncatum (Schw.) A. & M.) caused serious losses in home garden plantings during the summer and early fall. The disease, which affects the pods and leaves as well as the stems, develops and spreads rapidly during wet weather and may almost completely destroy the crop.

CRUCIFERS Anthracnose leafspot (Colletotrichum higginsianum Sacc.) caused considerable defoliation of garden turnips and chinese cabbage during the winter, spring and fall.

Downy mildew (Peronospora parasitica Pers. ex Fries) caused losses ranging up to 100 percent in cabbage plant beds in New Hanover County in January and February.

NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

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[1] Ellis, D. E., and F. A. Todd. Control of lettuce damping-off. North Carolina Agr. Exp. Sta. Spec. Cir. No. 4, August 1945

[2] The writers are indebted to Dr. John T. Middleton for confirming the identification of isolates of P. debaryanum and P. spinosum .

VEGETABLE DISEASES IN IOWA, 1946

D. M. Coe and W. J. Hooker

The following observations were made in the field on surveys and in experimental plots, as well as on material submitted to the Extension Service of Iowa State College.

BEANS Halo blight (Phytomonas medicaginis var. phaseolicola) [Pseudomonas phaseolicola] and common blight (Phytomonas [Xanthomonas] phaseoli) were common in most bean plantings throughout the State, causing considerable damage. In the trial gardens of one of the leading seed companies, the degree of infection varied markedly among the several varieties being tested. Rust (Uromyces appendiculatus) [U. phaseoli var. typica] was observed in one garden planting in Southeastern Iowa. Powdery mildew (Erysiphe polygoni), observed in Southeastern Iowa, as well as in the Marshalltown area, caused little or no loss.

CABBAGE Cabbage yellows (Fusarium oxysporum f. conglutinans) was observed in the Fertile area of Northern Iowa on peat soil. Symptoms were severe on 10 percent of the plants early in August but at the end of August most of the plants showed marked recovery with little to no chlorosis. This attenuation of symptoms coincided with a period of cooler temperatures and increased rainfall. Black rot (Bacterium campestre) [Xanthomonas campestris] was present in cabbage and rape causing minor damage. In the Muscatine area a disorder considered to be edema, causing considerable loss, was characterized by small, light tan, raised areas on the ribs of leaves, both on the outside and inside of the head. One grower reported a loss of 50 percent of his crop.

CARROTS The aster yellows virus was generally present causing losses of from 15 to 35 percent in the carrot plantings of Northern Iowa. The carrot leaf blights (Cercospora carotae and Macrosporium carotae [Alternaria dauci]) were present in from moderate amounts to severe form in most fields of Northern Iowa. Toward the close of the season approximately 15 percent of the lower leaves were killed.

CUCURBITS Bacterial wilt (Bacillus tracheiphilus [Erwinia tracheiphila] was found affecting a high percentage of cucumber plants in the Clinton area and was responsible for the death of approximately 20 percent of the plants in one field. It was also observed in one field of cantaloup near Clinton and specimens were received by mail from Council Bluffs. Anthracnose (Colletotrichum lagenarium) had become severe by September 1 in some watermelon and cantaloup fields in the Muscatine Island and Conesville areas. Some growers feared the loss of entire fields of certain susceptible varieties. Considerable

variation was evident in the amount of infection present in different fields early in September. A mosaic disease of cannery pie pumpkin (specific virus not determined) has been observed in six out of seven fields examined. Incidence of this disease was generally in excess of 10 percent. Fusarium wilt (Fusarium oxysporum f. melonis) was present on watermelons in southeastern Iowa in varying amounts. Some plantings of the Black Diamond and other susceptible varieties were a total loss, whereas mortality of resistant varieties ranged from a trace to 50 percent.

HORSERADISH Near Muscatine three fields of horseradish, totaling approximately 30 acres, were found heavily affected with white rust (Albugo candida). Approximately 5 percent of the leaves were dead and over 50 percent of the green leaves showed infection of from slight to severe intensity. It is estimated that a 20 percent loss of leaf area was sustained.

ONIONS The aster yellows virus on onion was present on the peat soil onion districts of North-central Iowa causing losses of 5 to 10 percent in various fields. In fields where healthy plants were mature on August 31, diseased plants were still in varying stages of immaturity. The light yellow color of the foliage and the excessive number of leaves made this disease very noticeable to the growers.

POTATOES Black leg (Pectobacterium phytophthorum (Frank) Waldee--Erwinia phytophthora (Appel) Bergey et al) was present in amounts varying from a trace to 5 percent in fields inspected for certification. In commercial fields and home plantings the incidence was even higher, 30 to 40 percent. Ring rot (Phytomonas sepedonica) [Corynebacterium sepedonicum] was found in fields of Pontiac and Sebago, the seed of which was known to be infected in 1945. Rhizoctonia (Corticium vagum) [Pellicularia filamentosa] on potato stemswas present in slight amounts, 1 to 5 percent, in all fields inspected. Early blight (Macrosporium [Alternaria] solani) in trace amounts was present by July 15 on the Cobbler variety with infection becoming progressively more severe as the season advanced. By August 20 the disease was severe and causing heavy defoliation. The importance of early blight was most obvious where hopper burn had been controlled by the use of DDT.

Late blight (Phytophthora infestans) was first observed in slight amounts at Crystal Lake on August 21. At St. Ansgar and Fertile, fields observed on August 30 had a severe infection. One 30 acre field of Katahdins was affected from trace amounts to complete loss of the foliage in scattered parts of the field. Most of the potato crop was mature before late blight hit but there is reason to expect a heavy loss in storage from tuber rot in the late varieties.

Potato scab (Actinomyces scabies) was more severe than in 1944 and 1945. Losses in susceptible varieties in the Crystal Lake area will be great.

SWEETPOTATOES Stem rot (Fusarium oxysporum f. batatas) was observed in the Muscatine and Conesville areas on resistant varieties causing the death of 1 percent or less of the plants, although infection was present in 5 to 10 percent of the plants. In susceptible varieties on heavily infested soil the loss was considerably higher. Soil pox (Actinomyces ipomoea) caused a loss of at least 5 percent in certain fields on Muscatine Island. Several growers reported that sweetpotato culture has been abandoned in certain of their fields because of soil pox. Black rot (Ceratostomella [Endoconidiophora] fimbriata) caused losses ranging from 1 to 5 percent.

TOMATOES Leaf spots (Septoria lycopersici and Macrosporium [Alternaria] solani) by August 26-28 had destroyed the lower 25 percent of the foliage in several plantings in central and eastern Iowa. In the Ames area Septoria was responsible for approximately 90 percent of the defoliation, with Macrosporium accounting for less than 10 percent of the loss. Infection was severe on considerably more of the foliage later in the season. Late blight (Phytophthora infestans) has been reported from numerous locations in northern, central and eastern Iowa in both commerial and home plantings. In three large plantings near Marshalltown losses were well over 50 percent of the fruit and foliage infection was severe. The first confirmed report of late blight on tomatoes was on August 15 in east-central Iowa. Wilt (Fusarium oxysporum f. lycopersici) was found in scattered plants in the Clinton area and at Ames and isolated from diseased plants as early as July 1. One lot of hot bed grown tomato plants from Mason City was found heavily infested with root knot nematode (Heterodera marioni).

BOTANY AND PLANT PATHOLOGY SECTION
IOWA AGRICULTURAL EXPERIMENT STATION AND
IOWA AGRICULTURAL EXTENSION SERVICE
AMES, IOWA

SPRAYING GRAPES TO CONTROL BLACK ROT

M. C. Richards

Black rot caused by Guignardia bidwellii is the most serious disease occurring on cultivated grape varieties in New Hampshire. The grapes on unsprayed vines in home gardens are often a total loss as a result of this disease. The standard spray recommendation for its control is two or more applications of Bordeaux mixture during the season. At times a sticker is used with the Bordeaux mixture and an insecticide included for insect control.

During the 1946 growing season four materials were applied on the grape variety test block at the Horticultural farm at Durham. These were: Bordeaux mixture 6-6-100; Fermate (Dimethyldithiocarbamate) 2:100; Zerlate (zinc dimethyldithiocarbamate) 2:100; and Phygon (2, 3, dichlor-1, 4-naphthoquinone) 1:100. Spray applications were made on June 22, July 16, and August 19. The sprays were applied at 250-300 lbs. pressure with a three-nozzle boom. A 50 percent wettable DDT (1-100) was added to each of the four materials in the first two spray applications.

Data taken on August 27 showed that all of the combinations used had given good control of black rot on the foliage. The fruits, however, showed from a trace to severe rotting, indicating that a sticker will have to be used with each of the four fungicides in order to obtain disease control on the fruits. In the case of Phygon slight to severe flecking of the fruits occurred, showing that this material cannot be used at 1:100 concentration on grapes. The flecking occurred on all of the seven varieties to which Phygon was applied.

The fruits of the varieties in the test block showed injury from black rot as follows: Severe loss of fruit (50 to 75 percent) - Westfield, Buffalo, Hector, Seneca, Erie, Ruby, Niagara, Concord, Minnesota hybrid 66, Geneva seedlings 15302, 15590, 15709, 16470, 17598. Moderate losses (10 to 25 percent) - Brocton, Van Buren, Yates. Trace of infection - Kendaia, Worden, Fredonia, Geneva seedlings 11987, 16241. Clean, no infection - Concord seedless, Minnesota seedlings 45 and 69.

NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION
DURHAM, NEW HAMPSHIRE

TOBACCO DISEASES IN KENTUCKY, 1946

W. D. Valleau and E. M. Johnson

Blue mold (Peronospora tabacina). The outbreak of blue mold was early in 1946. The first diseased bed was seen April 17 but the disease must have been present two weeks. A few other diseased beds were reported from the southern part of the State the next few days during a dry period. The first three days of May were wet and by May 4 the disease was reported from 23 counties, nearly always in second-year beds. There seemed to be no question that the disease originated from carry-over from second-year beds and gradually spread from them to new beds, in contrast to 1945 when all beds in Kentucky and probably in Tennessee also were infected from spores blown in from the south and southeast. Injury was rather severe in the northern part of the State but less severe in the southern as plants were well advanced toward setting size at the time of the outbreak. Only a very limited supply of Fermate was available but where used properly either as a spray or dust it gave excellent control. One grower purchased a power spray and a supply of Fermate early and, after planting 275 acres of tobacco, sold about $4000 worth of plants. He was able to save plants not only in early-sowed beds but also in very late beds when inoculum was abundant.

Cold injury causing chlorosis of the bud leaves was prevalent over most of the State about April 15.

Wildfire (Bacterium tabacum) [Pseudomonas tabaci] injury in plant beds was probably worse than usual. As in the past ten years, complete control in the bed was obtained by growers who used Bordeaux mixture early in an amount sufficient to leave a blue coating over the surface of the bed. Wildfire developed in many fields following heavy rains in May and June after setting. Fields from infected beds usually had the disease generally distributed, while if it occurred in fields set from treated, clean beds, the disease was usually limited to an occasional few plants. Fortunately the latter part of the summer was dry and the disease caused little injury. What has been said for wildfire applies to angular leafspot [Pseudomonas angulata] also.

Black root rot (Thielaviopsis basicola). As in 1945 the early season was ideal for the development of black root rot. The season was moist and the temperature unusually low. Because of the losses in 1945, many more growers turned to the root-rot resistant varieties, Ky. 16 and Ky. 41A, and to a new variety Ky. 22 only recently introduced, than in the past, but still there were many reports of failure of plants to start early in the season. Some growers who planted a susceptible variety and saw that it would fail replanted with a resist-

ant one with good results.

1945 and 1946 were test years for resistant varieties. Ky. 16 and Ky. 41A made good growth in the Station black root-rot plot as compared with the old susceptible varieties, which were a failure, but some new varieties deriving resistance from the so-called immune T. I. selections T. I. 87 and 88, grew nearly twice as rapidly as Ky. 16 and Ky. 41A. Certain of these look sufficiently promising to be introduced in the near future.

Black root rot probably did not cause the damage in 1946 that it did in 1945 because July and August were more favorable to recovery in 1946 than in 1945.

Anthracnose was reported from 1 plant bed in Pulaski County.

Frenching, usually associated with a soil of pH 5.8 or above, was reported from eight counties. In several instances P, K, and NO_3 were all high in plant tissue tests.

Fusarium Wilt [F. oxysporum f. nicotianae]. This disease is rather common in all parts of the State except the Bluegrass area of Central Kentucky. Ky. 33 and Ky. 34 are giving excellent control. Several new varieties resistant to Fusarium wilt, black root rot, and mosaic have been developed and are being tested with farmers. They are satisfactory so far as disease resistance is concerned, but it remains to be seen whether any of them will stand up well in wet weather. In two fields, one in Owen and one in Menifee County, root knot nematodes [Heterodera marioni] and Fusarium wilt were both present. In the Owen County tobacco the large and some of the smaller veins of the lower leaves were bordered with black material the nature of which was not determined.

Black shank (Phytophthora) was reported from Trimble, Franklin and Marion Counties in new locations and was again present in a planting in the City of Lexington that is planted to tobacco every year. The outbreak in Trimble County was along the Ohio River below the mouth of the Kentucky River, which in turn receives drainage from Elkhorn Creek, a stream that runs through Georgetown where black shank has been present many years.

Early blooming. Associated with the very wet setting season and unusually low temperature after setting, many fields of tobacco, particularly in the dark area in western Kentucky, bloomed very low and abnormally early. The same thing occurred at Lexington on a black root-rot plot set with varieties of differnt degrees of resistance to black root rot. Many plants bloomed at a height of less than one foot in fertile soil that was too wet in the early summer.

Streak (Virus) Streak was less prevalent in 1946 than in previous years, but one four-acre field in Graves County was reported as severely damaged.

Club-root, associated with slow growth following setting. We found several fields of burley tobacco in which many of the slow-growing plants were affected by the root disease we have previously called club-root. The larger roots are very much enlarged, looking somewhat like roots affected by the root knot nematode but nematodes are not present. The affected roots decay rather quickly. The leaves in the growing point sometimes curl under along the edges and are usually smaller than normal but usually plants would not be recognized as having the root disease by the foliage symptoms. The disease was found in Fayette, Owen, Boone, Henry and Mason counties. It is possible that the disease is the same as Black's wound tumor virus but no proof of this has been obtained.

Mosaic [Virus] Mosaic is gradually being recognized as a definite disease of tobacco by tobacco growers and many are trying to do something about it. One grower who raises over 200 acres of burley used trisodium phosphate while pulling, reduced the number of cultivations, dusted by hand rather than by a power-driven duster and prevented nearly all field spread in Ky. 16, a susceptible variety. About one-third of his planting was in Ky. 52, a mosaic-resistant (NN) variety. This variety has been entirely unaffected the past two years by mosaic on this farm. A mosaic-resistant variety (188 - 45), very similar in appearance to Ky. 16 but much more resistant to black root rot, was tested with a few farmers in 1946 with success as to disease resistance, plant type, yield, and quality. It will be tested more extensively next year.

Ky. 160, a mosaic-resistant (NN) One Sucker variety was grown extensively in Simpson and neighboring counties this year. Growers claimed that, aside from its complete freedom from mosaic, it was a better variety than their old One Sucker varieties. Several mosaic-resistant (NN) fire cured varieties were tested with farmers with success so far as mosaic resistance, yield, and quality are concerned. They are not resistant to black root rot.

Brown root rot. Meadow nematodes (apparently Pratylenchus pratensis) were found to be abundant in tobacco roots of several burley varieties in the brown root-rot plot at Lexington. They were also abundant in several grasses, legumes, and weeds growing in the same rotation series. It seems probable that meadow nematodes are the cause of brown root rot in this series of plots where tobacco always seems to start slowly.

KENTUCKY AGRICULTURAL EXPERIMENT STATION
LEXINGTON, KENTUCKY

REPORT OF THE REGIONAL PEANUT SEED TREATMENT TESTS CONDUCTED IN 1946

Prepared by S. B. Fenne, Chairman,
Row Crop Legume Committee

Alabama, North Carlina, South Carolina, and Virginia cooperated in the peanut seed treatment tests in 1946. The procedure followed was similar to that used in the previous years. All tests were replicated six times. The following materials were used by cooperators: Arasan, Ceresan 2%, Phygon, Dow 9, Dow 9-B, Spergon, Yellow Cuprocide, 1452-F, General Chemicals 668, and Merko Dust. Machine-shelled seed only was used in Alabama and South Carolina but both machine-shelled and hand-shelled seed was used in North Carolina and Virginia. North Carolina also ran tests on five different types of seed.

The seed treatment tests were conducted by the following cooperators: J. H. Jenson, Raleigh, North Carolina; C. J. Nusbaum, Blacksville, South Carolina; Coyt Wilson, Auburn, Alabama; and S. A. Wingard, L. I. Miller and E. T. Batten, Holland, Virginia.

The seed used in each test came from the same source. For treatment, dust was applied to the seed in a closed container and thoroughly shaken. The peanuts were planted according to the general practice followed in the areas where the tests were conducted. The treated and untreated kernels were dropped by hand at the rate of 100 per plot and spaced 6 inches apart in the row.

SUMMARY

Blacksville, South Carolina. 2% Ceresan was better than the other treatments; and all treatments gave an increased seedling emergence over the check.

The seed was planted May 16. Seedlings emerged May 22 and were counted June 3. The soil was Ruston Sandy loam, with a pH of 5.76. Moisture and temperature were optimum.

Auburn, Alabama. In tests with both Runners and Spanish peanuts all treatments were beneficial.

The Runner peanuts were shelled and treated April 15; planted April 16, 100 seed per 20-ft. row; stand counts were made April 7.

The Spanish peanuts were shelled and treated April 22; planted April 23, 50 seed per 6-ft. row; stand counts were made May 10.

Holland, Virginia. With hand-shelled seed there were no dif-

Table 1. Peanut seed-treatment studies at the North Carolina Agricultural Experiment Station - 1946. Peanut stand averages, to the nearest whole number, from six randomized replications of 100 seeds planted in each replication. Seed planted April 24; stand counts May 24. Variety N.C. 4. Upper Coastal Plains Branch Station, Rocky Mount, North Carolina. Treatments made two weeks before planting and at rates stated per 100 pounds.

Type and condition of seed	Stand averages from treatment							
	Ceresan 2% 4 oz.	U. S. 604 2 oz.	Dow 9 2 oz.	Dow 9-B 2 oz.	Cupro-cide 4 oz.	Arasan 3 oz.	Spergon 4 oz.	No Treatment
	No.	No.	No.	No.	No.	No.	No.	No.
Hand-Shelled								
Plump	63	61	65	57	59	59	61	58
Slightly-Shrivelled	36							31
Moderately Shrivelled	25	24	31	27	24	34	26	24
Severely-Shrivelled	16							12
Discolored-Plump	61	71	78	71	74	72	67	56
Machine-Shelled								
Plump	62	68	70	60	72	63	67	50
Slightly-Shrivelled	45							37
Moderately-Shrivelled	31	34	37	27	30	38	31	23
Severely-Shrivelled	20							16
Discolored-Plump	65	71	69	60	69	64	59	49
Injured-Plump	44	52	39	35	47	48	38	21

L.S.D. between types in treatments (5%) 9.39
(1%) 12.36

L.S.D. between treatments in types (.05) 10.76
(.01) 14.25

All seed furnished by Upper Coastal Plains Branch Station, Rocky Mount, North Carolina, and came from the same lot whether hand- or machine-shelled. Seeds were graded as plump, slightly shrivelled, moderately shrivelled, or severely shrivelled. Discolored seeds were plump but showing discolored blemishes on the seed coats. Injured plump seeds were sound seeds except for obvious injury to the seed coats, due to shelling operations. Slightly and severely shrivelled seeds were tested only in 2% Ceresan treatments and no treatments.

Moisture and temperature conditions were unfavorable for optimum seedling emergence during the tests.

Table 2. Effect of Different Seed Treatments on Emergence of Peanuts in 1946

Treatment	Dosage: Ounces per 100 lb.	Percentage of emergence in: North Carolina: Hand Shelled: N.C.-4	North Carolina: Machine Shelled: N.C.-4	South Carolina: Machine Shelled: Small Spanish	Alabama: Machine Shelled: Runner	Alabama: Machine Shelled: Spanish	Virginia: Hand Shelled: Jumbo	Virginia: Machine Shelled: Jumbo
Dow 9-B	2	57	60				93	96
Arasan	3	59	63	74.3	86.7	69.6	90	95
Arasan	2						92	91
Ceresan 2%	4	63	62	85.2	95.3	77.4	90	94
Phygon (U.S. 604)	2	61	68	73.0	91.7	61.8	91	90
Gen. 668	2			77.5				
Gen. 668	3						88	90
Gen. 668	4			74.8				
Spergon	4	61	67		84.3	57.4	93	89
Spergon	3			77.3				
Dow 9	2	65	70	77.8	92.8	63.6	89	88
Merko Dust	3			61.8				
Yellow Cuprocide	4	59	72		73.2	59.4		
1452-F	1 1/2				91.8	81.8		
Check	None	58	50	54.8	45.5	43.2	91	85
L.S.D., 5%		*	*	4.80	6.88	7.98	N.S.	4.28

* See Table 1

ferences in emergence between treatments or between the check and treatments. However, with machine-shelled seed, all treatments except Spergon and Dow 9 gave an increase in emergence over the check.

Each treatment was represented by 100 seed in each replicate and these were dropped by hand in a 50-ft. row. The seed was shelled early in May, treated May 16, planted May 17 and 18, and the emergence counts were made June 4.

Rocky Mount, North Carolina. For purposes of this report, only the figures given for "plump"seed are used.

All treatments on machine-shelled seed gave beneficial results; however, there were no significant differences in the results of the different treatments with hand-shelled seed.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS, VIRGINIA POLYTECHNIC INSTITUTE AND THE U.S.D.A. COOPERATING

VIOLET SCAB WIDELY DISTRIBUTED IN MARYLAND[1]

L. A. Walker, R. A. Jehle and Anna E. Jenkins

The earliest known record of violet scab (Sphaceloma violae Jenkins (4, p. 7) is that of the disease on cultivated or sweet violet (Viola odorata L.) at Garrett Park, Montgomery County, Maryland, 1897-1900 (3). Norton's report of an unidentified disease of violets ("watery pimples on leaf, R (rare), cause (?), perhaps insect") in Maryland in 1909 has been suggested (3, p. 355) as relating to violet scab. Definite published records of the disease in Maryland since 1933 are those from Chevy Chase, Rock Creek Park, and Bethesda, all in Montgomery County, and from one locality in Anne Arundel County (1, 2, 3, p. 7).

The fact that this destructive disease occurs widely in Maryland is shown by new records obtained by the writers in an effort to determine its distribution in the State (Table 1). Localities in the several counties where specimens have been collected are indicated on the accompanying map (fig. 1). Violets examined were chiefly those growing naturally along streams, in meadows or orchards, or spontaneously in gardens including lawns. The species of violet affected was not determined, but in most cases these were the blue flowering types. In general, the disease was abundant and the attack severe. In 1945 an intensive survey was made in Frederick County during August. Violet scab was very common along the banks of the Monacacy River and its feeder streams and in meadows and fence rows nearby in most areas visited. Violets growing at altitudes over 1000 feet appeared to be free of the disease in this County except for collections made in the Catoctin Mountain area near Foxville. Throughout the season of 1946 many wild violets were examined in various parts of Maryland. The disease was found as far west as Hancock, Washington County, but in Garrett County, where the elevation ranges from 2000 to 3000 feet above sea level, no evidence of its presence was found. On November 19, wild violets growing abundantly under trees in a park near Johns Hopkins University, Baltimore, were scab free.

In Table 1, the record from Lanham pertains to the disease on garden grown striped violet (Viola striata) and sweet violet, that from Riverdale (1936) to the disease on sweet violet in a small commercial greenhouse. The record from Rosaryville (Upper Marlboro P. O.) relates to the disease affecting sweet violets in a heated cold frame on the Dower House estate known historically as "Mount Airy". Because of the seriously diseased condition of the violets in the cold frame the superintendent of the estate sought advice from the University of Maryland in November, 1945.

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[1] Scientific Article No. A 142. Contribution No. 2034 of the Maryland Agricultural Experiment Station (Department of Plant Pathology).

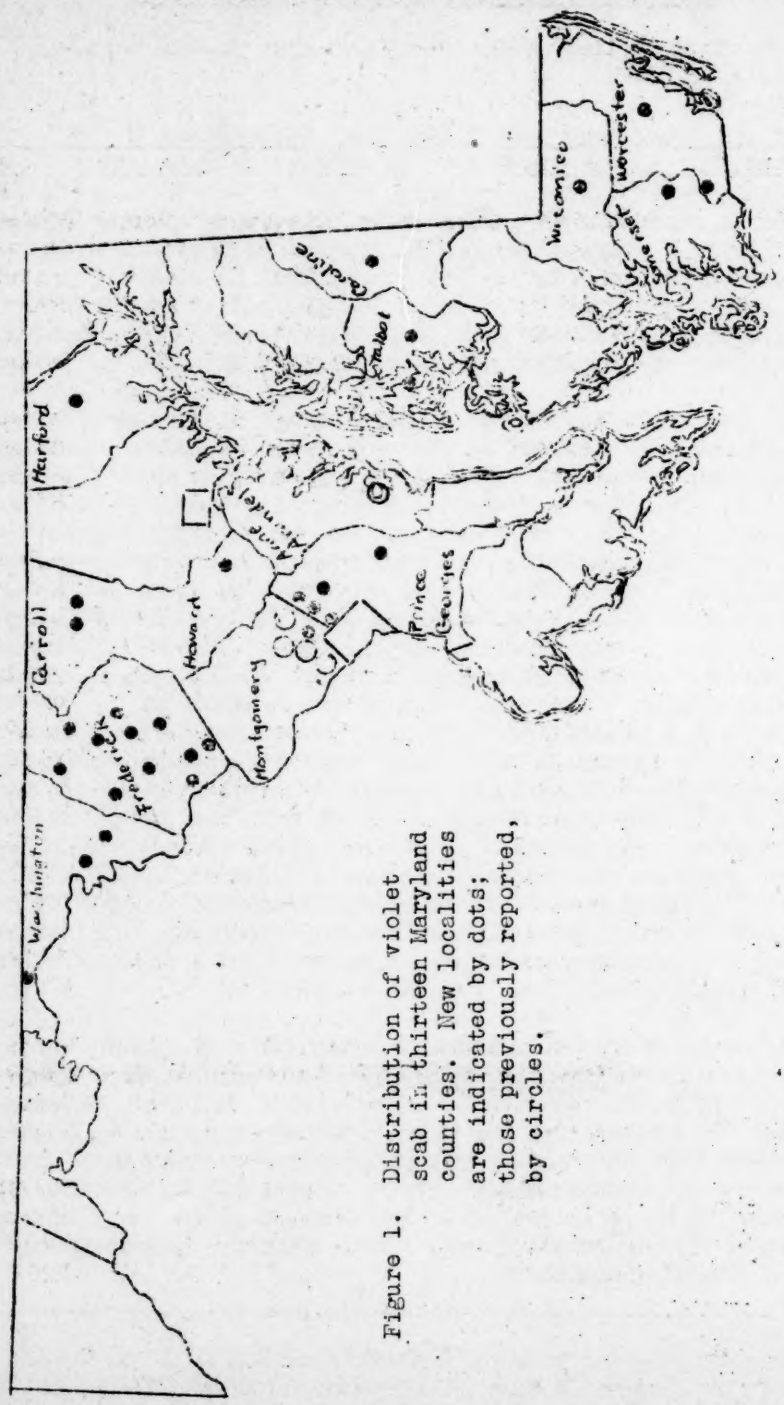

Figure 1. Distribution of violet scab in thirteen Maryland counties. New localities are indicated by dots; those previously reported, by circles.

Table 1. New Records of violet scab in Maryland

(Representative specimens have been deposited in the herbarium of the Department of Plant Pathology of the University of Maryland and in the Mycological Collections of the Bureau of Plant Industry.)

County	Town	Date	Observer
Caroline	Ridgely	October 30, 1946	Jehle
Carroll	Tyrone	November 3, 1946	Jehle
Frederick	Westminster	August 25, 1946	Walker
	Westminster	August 30, 1946	Jehle
	Catoctin	August 9, 1945	Walker
	Creagerstown	August 9, 1945	Walker
	Dickerson	September 3, 1946	Walker
	Foxville	August 26, 1945	Walker
	Frederick	August 8, 1945	Walker
	Middletown	October 2, 1946	Jehle
	Point of Rocks	August 11, 1945	Walker
	Doubs	August 11, 1945	Walker
	Thurmont	August 9, 1945	Walker
	Walkersville	August 10, 1945	Walker
Harford	vic. Churchville	October 18, 1944	Walker
Howard	Relay	September 10, 1942	Walker
Montgomery	Chevy Chase	July 24, 1945	Jenkins
		August 22, 1946	Stevenson
	Garrett Park	Summer, 1945	Jenkins
	Kensington	October 1, 1944	Fessenden
	Rock Creek Park	October 1, 1944	Fessenden
	Rockville	October 14, 1944	A. Gude
Prince Georges	College Park	July 17, 1946	Walker
	Hyattsville	May 21, 1946	Jehle
	Lanham	September 25, 1946	Toole
	Riverdale	Summer, 1936	Woods
	vic. Rosaryville	November 14, 1945	Walker
		April 16, 1945	Jehle & Jenkins
		July 12, 1946	Jehle
Somerset	Princess Anne	September 20, 1946	Jehle
Talbot	Easton	October 31, 1946	Jehle
	Uniontown	October 31, 1946	Jehle
Washington	Breathersville	September 3, 1946	Walker
	Hancock	September 4, 1946	Walker
	Keedysville	October 14, 1946	Walker
Wicomico	Salisbury	July 30, 1946	Jehle
Worcester	Pocomoke	September 19, 1946	Jehle
	Snow Hill	September 18, 1946	Jehle

Upon visiting Dower House it was found that the disease in question was violet scab. In an attempt to control the malady, infected leaves were removed and destroyed. When the property was visited again on April 16, 1946, it was learned that the plants had thrived and bloomed well during the winter. As casually viewed on April 16, they appeared healthy. Closer examination, however, revealed that scab lesions were not rare on blades and petioles of occasional old yellowed leaves remaining on the plants. Violets of the same history as those in the heated cold frame but growing in a nearby open frame were entirely healthy as were wild violets growing plentifully on the premises.

On a third visit (July 12), the disease was found on white sweet violets that had been obtained locally, held temporarily in a greenhouse, then transplanted in the greenhouse. Plants from the open cold frame also had been transplanted nearby and the disease was spreading to those nearest the white sweet violets. Upon recent inquiry it was learned that the white sweet violets were practically destroyed by the scab, but that spraying had prevented further spread of the disease on the blue sweet violets.

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DEPARTMENT OF PLANT PATHOLOGY, UNIVERSITY OF MARYLAND AND DIVISION OF MYCOLOGY AND DISEASE SURVEY, U.S. BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

SCAB IN A VIOLET COLLECTION IN VIRGINIA AND SOME NEW RECORDS IN OTHER STATES

Anna E. Jenkins[1]

Whetzel (9) has written of havoc wrought by violet scab (Sphaceloma violae Jenkins) in his garden at Forest Home, Ithaca, New York and of "grave threat of the disease to garden grown species of violets." Thaxter (7) also has described destruction from the disease in her violet collection at Washington, Connecticut.

A third instance of attack by the disease in a much-prized violet collection came to the writer's attention in July, 1946. The violets had been assembled over a period of ten years by Mrs. Louis D. Elliott, in her garden at Falls Church, Fairfax County, Virginia.

The scab was first recognized on one group, of Mrs. Elliott's violets by Dr. L. H. Weld, who was familiar with the disease because of its presence in his own garden at Falls Church, Arlington County, Virginia (3, p. 88). At Mrs. Elliott's invitation the writer visited her garden on July 6. Upon becoming acquainted with its symptoms Mrs. Elliott completed the survey for the disease in her collection. She now realizes that this malady may have been responsible for the past disappearance of some species in her garden, particularly the extremely susceptible cultivated or sweet violet (Viola odorata). Last July's survey revealed that at least twenty-seven species and one variety in this collection were affected by the scab, as follows: Viola affinis*, V. blanda*, V. canadensis, V. conspersa, V. cucullata, V. emarginata*, V. fimbriata*, V. hirsutula*, V. incognita*, V. langloisii*, V. latiuscula*, V. nova-angliae*, V. palmata, V. papilionacea, V. pedatafida*, V. primulifolia, V. rosacea*, V. sagittata*, V. septentrionalis, V. sororia, V. stoneana, V. striata, V. triloba*, V. triloba var. dilatata*, V. jooi, V. odorata, V. patrini-chinensis, and V. rosea sylvestris*. The disease had not been observed previously on the species marked with an asterisk. The last four species in the list are of foreign origin, the others all North American. Whetzel (9) remarked that violet scab apparently had not yet been discovered affecting our northern violets growing in the wild. The fact that all but two of the North American violets listed above grow in the Atlantic basin north of latitude 37° (1, p. 13) suggests strongly that these species growing northward in their native habitats could easily fall prey to the disease if attacked by it.

Mrs. Elliott examined native violets in New Hampshire during the past autumn, without finding any evidence of the disease. However,

[1] Grateful appreciation is expressed to Mrs. Louis D. Elliott for her cooperation in obtaining additional data on the distribution of this disease.

she and others have added to its known distribution and prevalence on wild as well as garden-grown violets in the East in the neighborhood of Latitude 37°, as specimens that have come to the writer's attention show. In September, Mrs. Elliott discovered affected wild violets growing along the Shenandoah River in West Virginia. The first known record of the disease in that State had been obtained the previous June, when early attack on a garden-grown wild species at Morgantown was noted by Mr. J. A. Stevenson. In October, the disease was found on wild violets growing on Pinnacles Picnic Area on the Skyline Drive in Virginia, by Dr. E. H. Toole. In Delaware, Dr. R. A. Jehle found a few infected violet plants growing spontaneously in a shaded lawn in Bridgeville, Sussex County on September 21, 1946, after a limited search in a few blocks. This appears to be the first record of the disease in Delaware. Numerous records from Maryland are now available (8). In 1944 violet scab had been recorded in all Coastal States from Massachusetts to Texas, except Delaware (4); in 1945 it was found on violets in Illinois (2). It is still to be hoped that the disease may not reach wild violets growing in their native habitats, or violets growing anywhere now scab-free. It would be advantageous if growers would familiarize themselves with the symptoms of this seemingly worst violet malady (cf. 6) and exercise sanitary precautions to prevent its spread. Symptoms are described by Massey and Jenkins (5) with illustrations. To control scab in her violet collection, Mrs. Elliott sprayed the plants with Bordeaux mixture (4-2-50) repeating the applications sufficiently to keep the new growth covered. The results appeared to be satisfactory.

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DIVISION OF MYCOLOGY AND DISEASE SURVEY, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

BRIEF NOTES ON PLANT DISEASES

THE OCCURRENCE OF INTERNAL CORK OF SWEETPOTATOES IN LOUISIANA

By L. H. Person and E. Olson

Internal cork of sweetpotato, as described by C. J. Nusbaum of the Edisto Experiment Station, Blackville, South Carolina, was first observed and recognized in Louisiana on October 29, 1946. The disease was observed in a variety test plot of the Experiment Station being carried out at St. Francisville, Louisiana. From the limited amount of sweetpotatoes examined for symptoms, the highest percentage of infection was found in the Edisto Station Porto Rico selection. The disease was also found in the following varieties and seedlings: Kansas 40, L 78, Porto Orado, B 703, and No. 132056. The disease has also been found in test plots located at Baton Rouge.

No survey has been made in the certified seed producing or commercial growing area; however, these areas will soon be surveyed to determine the extent of the distribution of this new disease in Louisiana. -- LOUISIANA STATE UNIVERSITY, BATON ROUGE. NOVEMBER 5.

BACTERIAL SOFT ROT OF CABBAGE IN FLORIDA

By G. R. Townsend

A disease of cabbage somewhat resembling black rot has been noted in early fall cabbage for several years and has been particularly destructive in recent weeks. It seems to differ from black rot in that vascular discoloration is seldom seen and infection starts at many points over the leaf rather than along the edges. The lesions are dark and water-soaked at first but turn brown as the tissues dry out. In wet weather the disease may progress into the stem showing occasional vascular discoloration but more often a watery soft rot in the pith. When this happens the plant dies.

The disease appears to be of a bacterial nature and is associated with soil conditions rather than the seed.

The hot water seed treatment failed to control it. Evidence has been noted that the disease is associated with transplanting injuries as it has been of little importance in cabbage drilled in the field. Injuries to the roots may account for some of the infection in the stems but wilting of the transplanted plants and subsequent sprinkling with portable irrigation equipment seems to have

some relation to the trouble. It has been worse where the plants wilted against the soil before water was applied than where the sprinkling quickly followed transplanting. The disease has also appeared in plants with leaves water-soaked in torrential rains. -- BOX 505, BELLE GLADE, FLORIDA. November 6.

BEAN RUST IN MARYLAND

By R. A. Jehle

Bean rust (Uromyces phaseoli) was found on every plant examined in a field of Bountiful and Plentiful beans in Worcester County on the Maryland Eastern Shore. Rust pustules were so numerous that they practically covered the entire surface of the lower leaves. Such leaves were turning yellow and falling to the ground. The growers estimated that the crop would be almost a total failure. Another grower in the neighborhood reported a similar condition in his field of Bountiful beans. -- UNIVERSITY OF MARYLAND, COLLEGE PARK.

SOME DISEASES OF CROP PLANTS IN KENTUCKY, 1946

By W. D. Valleau and E. M. Johnson

Phytophthora root rot of sweet clover occurred in Henry County. Numerous oospores were found in the decayed roots.

Rust of red clover (Uromyces trifolii) was very prevalent in the State throughout the summer.

Potato black leg [Erwinia phytophthora] was reported from four counties in central Kentucky from the 8th to 13th of June, a wet period.

Stewart's disease of field corn [Bacterium stewartii] was the cause of failure of several fields of hybrid corn before the corn was two feet high. The damage occurred in late June and early July in Jefferson, Mercer, Jessamine, Lincoln and Scott counties. -- KENTUCKY AGRICULTURAL EXPERIMENT STATION

CHECK LIST REVISION

Freeman Weiss

BENINCASA (CUCURBITACEAE)

BENINCASA HISPIDA Cogn., CHINESE WAXGOURD. Annual vine of tropical Asia, sometimes grown for culinary use.

Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. Ind.
Heterodera marioni (Cornu) Goodey, root knot. ? Fla.
Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Mass.

BRYONOPSIS (CUCURBITACEAE)

BRYONOPSIS LACINIOSA Naud. Annual vine of tropical Asia, grown for ornamental fruit.

Pseudomonas lachrymans (E.F.Sm. & Bryan) Carsner, bacterial spot. Wis.
Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Mass., Ohio

CITRULLUS (CUCURBITACEAE)

CITRULLUS VULGARIS Schrad., WATERMELON (1), and C. V. var. CITROIDES citron (2). Annual vine of tropical and S. Africa, cult. for edible fruit, fresh (1) or preserved (2), throughout the U.S. except the extreme north; commercially chiefly in the Southeastern and Gulf States to Md. and Iowa, also in Calif.

Alternaria cucumerina (Ell. & Ev.) J. A. Elliott, leaf spot. General except the Pacific Coast States (1); Minn. (2). A. brassicae (Berk.) Sacc. var. nigrescens Pegl. (A. nigrescens (Pegl.) Neerg.) is said to be a synonym.
(Ascochyta citrullina C.O.Sm.): Mycosphaerella c.
Cercospora citrullina Cke., leaf spot. N.J. to Fla., Tex., and Ohio; also P.R., Guam (1); N.J. (2)
Cladosporium cucumerinum Ell. & Arth., on leaves. Md., Nebr., P.R.
Colletotrichum lagenarium (Pass.) Ell. & Hals. anthracnose. General except the Pacific Coast (1); Iowa, N.Y. (2). The proposed change of the specific name to lagenariae, based on Fusisporium lagenariae Schw., does not appear to be warranted by examination of the Schweinitz specimen.
Cribopeltis citrullina Tehon, fruit speck. Ill.
Diplodia spp., stem-end rot, gray rot. Md. to Fla., Ariz., and

Citrullus cont.

and Kans. (1) Chiefly D. tubericola (Ell. & Ev.) Taub. and D. natalensis P. Evans (=D. theobromae (Pat.) Nowell), conidial forms of Physalospora rhodina and ? P. abdita, q.v.

(Diplodina citrullina (C.O.Sm.) Gross.): Mycosphaerella c.

Erwinia aroideae (Town.) Holland, soft rot. W.Va.

E. tracheiphila (E.F.Sm.) Holland, bacterial wilt. Reported occasionally in various localities but occurrence on this host is exceptional; reported resistant in most inoculation experiments.

Erysiphe cichoracearum DC., powdery mildew. Ariz., Calif., Fla., Ga., N.Y., N.Car., Tex., Va. (1) See note on this sp. under Cucumus sativus.

Fusarium oxysporum (Schlecht.) f. niveum (E.F.Sm.) Snyder & Hansen (F. bulbigenum Cke. & Mass. var. niveum (E.F.Sm.) Wr.), wilt. General, including Pacific Coast (1); Iowa (2).

F. scirpi C.R.Lamb. & Fautry, fruit rot.

Helminthosporium sp., fruit rot. Tex. (1)

Heterodera marioni (Cornu) Goodey, root knot. N.Car. to Fla., Tex., and Okla.; also Ariz., Calif. (1)

Macrophoma sp. (? M. citrulli (Berk. & Curt.) Berl. & Vogl., associated with blossom-end rot. Ga., Mo. (1)

M. seminalis (Berk. & Curt.) Berl. & Vogl., on seeds. S.Car. (1) Also reported on leaves.

Macrophomina phaseoli (Maub.) Ashby, charcoal rot (stems). Tex. (1, 2)

Mycosphaerella citrullina (C.O.Sm.) Gross., gummy stem blight, stem-end rot, leaf spot. Mass. to Fla., Ariz., and Mo.; P.R. (1)

Phyllosticta citrullina Chester, leaf spot. Del., Ga., S.Car. Probably a conidial stage of Mycosphaerella citrullina.

? P. cucurbitacearum Sacc., on stems. Fla., Ky., Ga., Mo. (1)

Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Tex. (1)

Physalospora abdita (Berk. & Curt.) N.E.Stevens, and P. rhodina (Berk. & Curt.) Cke. on dead stems. Fla. (1) See also Diplodia spp.

Phytophthora spp., fruit rot, stem rot. P. cactorum (Leb. & Cohn) Schroet., in Ariz. (1); P. capsici Leonian in Colo. (1); P. citrophthora (R.E.Sm. & E.H.Sm.) Leonian in Calif. (1)

? Pseudomonas lachrymans (E.F.Sm. & Bryan) Carsner, bacterial spot. Mich. (1) Artificial inoculation reported negative on this host.

Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Occasional from Mass. to Fla., Tex., and Wis.; also Calif. (1); Fla. (2)

Pythium spp., blossom-end rot (fruit), damping off, root rot. The spp. most commonly associated with blossom-end rot and

Citrullus cont.

other decay of fruit are P. acanthicum Drechs., reported in Fla., Ga., Ind., Iowa, Md., Mo., Va.; P. aphanidermatum (Edson) Fitz., in Ariz. (also root rot), Fla., Va. P. irregulare Buis. in Iowa, and P. ultimum Trow in Calif., both also causing damping off. Other spp. sometimes causing fruit rot are P. artotrogus (Mont.) DBy., P. debaryanum Hesse, P. helicoides Drechs., P. myriotylum Drechs., P. periplocum Drechs., reported in the Middle Atlantic and Southeastern States to Tex.

Rhizoctonia solani Kuehn, damping off, soil rot (fruit) Pa. to Fla. and Iowa (1); leaf blight. Ga., Tex. (1)

Rhizopus spp. (chiefly R. stolonifer (Ehr. ex Fr.) Lind), mushy soft rot. Occasional (1)

Sclerotinia sclerotiorum (Lib.) DBy., cottony rot. N.J., Tex. (1)

Sclerotium rolfsii Sacc., southern blight, soil rot (fruit). N. Car. to Fla., Tex., and Mo. (1). The basidial stage Corticium r. Curzi has been produced in Tex. in cultures derived from this host.

Septoria citrulli Ell. & Ev., leaf spot. N.J., N.Y. (1)

S. cucurbitacearum Sacc., leaf spot. Wis.(1)

Thielaviopsis basicola (Berk. & Br.) Ferr., root rot. Oreg., Utah. (1)

Verticillium sp., wilt. N.H., Oreg. (1)

V. albo-atrum Reinke & Berth., wilt. Calif. (1)

Volutella citrulli Stonem., on fruit. N.Y. (2)

Blossom-end rot -- in part, infection by Pythium spp. (q.v.) and various secondary organisms; in part attributed to non-parasitic factors.

Internal browning -- physiological, attributed to drought or nutritional deficiencies. Fla., Ga., Kans., Mo. (1)

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.) Calif. (1,2); Ida., Oreg. (1)

Mosaic -- unidentified virus(es). N.Y. to Fla., Tex., and Iowa; also Ariz., Calif., Mich. (1); Iowa (2). Although the artificial transmission of cucumber mosaic virus (Marmor cucumeris Holmes) to watermelons has been reported several times, they have generally proved resistant to the common strains of this virus. Variant forms reported as crinkle mosaic in Tex., and ringspot in N.Y., presumed to be of virus origin, are on record.

CUCUMIS (CUCURBITACEAE)

CUCUMIS ANGURIA L., WEST INDIAN GHERKIN. Annual vine of tropical America, grown for ornament and the small fruits which are

Cucumis cont.
used for preserving. (Commercial "gherkins" are small cucumbers.)

Diplodia theobromae (Pat.) Nowell, fruit rot, Virgin Is.
Erysiphe cichoracearum DC., powdery mildew. Mass.
Pellicularia koleroga Cke., thread blight. P.R.
Pseudomonas lachrymans (E.F.Sm. & Bryan) Carsner, angular leaf spot. Wis.
Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Ohio, Tex., Virgin Is.

CUCUMIS MELO L., MUSKMELON including var. RETICULATUS Naud., cantaloup of trade (1), and var. INODORUS Naud., CASSABA, WINTER MELON (Honey Dew, etc.) (2). Annual vine of southwestern Asia (or Africa ?), grown throughout the warmer parts of the U.S.; commercially chiefly in Calif., Ariz., Tex., Colo. and Utah, the Middle Atlantic, East Central, and Southeastern States; production of (2) chiefly in Calif. (Imperial Valley), Ariz. and Colo.

Alternaria spp., Alternaria rot (fruit). General in transit and markets (1,2). Specific identity not usually reported but sometimes referred to A. brassicae var. microspora Sacc. (= A. oleracea Milbrath, ? A. circinans (Berk. & Curt.) Bolle). A. tenuis Nees ex Cda. also commonly associated, perhaps secondary; also frequent on seed.

A. cucumerina (Ell. & Ev.) J.A.Elliott, leaf blight, black-mold blight. General (1); Colo. (2). Reported also as A. brassicae (Berk.) Sacc. var. nigrescens Pegl. (=A. nigrescens (Pegl.) Neerg.), generally regarded as a synonym. The earlier name A. cucurbitae Letendre & Roum. is of doubtful application.

Cercospora sp., leaf spot. Colo., Ga., Tex. C. citrullina Cke. Guam; C. cucurbitae Ell. & Ev., Del., Ind., Tex.

Cladosporium cucumerimum Ell. & Arth., scab (foliage). Occasional in Eastern and Central States (Mass. to Va. and Mich.) (1); also Cladosporium rot of fruit, on (1) and especially (2) in markets.

Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose (foliage and fruit). General in the East and South to Ariz., Colo. and N.Dak. (1,2)

Cuscuta arvensis Beyrich, dodder. Md. (1)

Diplodia natalensis Pole-Evans, Diplodia rot, gray rot. Tex. (1). Conidial stage of Physalospora rhodina (Berk. & Curt.) Cke.

Erwinia aroideae (Town.) Holland, and E. carotovora (L.R.Jones) Holland, bacterial soft rot. Occasional in markets in Eastern and Southern States, Mass. to Fla. and Tex. (1).

E. tracheiphila (E.F.Sm.) Holland, bacterial wilt. General east of Rocky Mts., also Ariz., Colo., Ida., Wash. (1)

Cucumis melo cont.

Erysiphe cichoracearum DC., powdery mildew. General, including Ariz., Calif. and Utah (1); Ariz., Calif. (2). See note on this sp. under C. sativus

Fusarium spp., fruit rot. General in markets, occasional in fields, in the Eastern and Central States; also Ariz., Calif., Colo. (1,2). The following spp. identified: F. culmorum (W.G.Sm.) Sacc., F. equiseti (Cda.) Sacc., F. graminum Cda., F. scirpi C.R.Lambert & Fautr., F. s. var. acuminatum (Ell. & Ev.) Wr. and var. compactum Wr., and F. semitectum Berk. & Rav., (all synonyms of F. roseum (Lk.) emend. Snyder & Hansen); F. moniliforme Sheld. var. subglutinans Wr.; F. solani (Mart.) App. & Wr.

F. oxysporum Schlecht. f. melonis (Leach & Currence) Snyder & Hansen (also reported as F. bulbigenum Cke. & Mass. var. niveum (E.F.Sm.) Wr.), Fusarium wilt. General, including the Eastern, Central, and Southern States, also the far West, though different physiologic races of F. oxysporum may be involved (1); Ariz., Calif., Colo. (2).

Heterodera marioni (Cornu) Goodey, root knot. N.J. to Fla. and Calif. (1). Often associated with Fusarium wilt.

Macrophomina phaseoli (Maub.) Ashby, charcoal rot (root, stem and fruit). Ore., Tex. (1), Calif. (2)

(Macrosporium cucumerinum Ell. & Ev.): Alternaria c.

Monilia sitophila (Mont.) Sacc., fruit rot after prolonged storage. Ind., N.Y. (2). Conidial stage of Neurospora sitophila Shear & B.O.Dodge.

Mucor sp., fruit rot following cold storage. N.Y. (2)

Mycosphaerella citrullina (C.O.Sm.) Gross., gummy stem blight. Del., Mass., N.J., N.Y., Tex., P.R. (1); Fla. (2)

Penicillium spp., blue-mold rot usually after prolonged storage or low-temperature breakdown. Occasional in markets (1,2)

Phoma terrestris Hansen, secondary root rot. Colo., Iowa (1)

Phyllosticta sp., leaf spot. Ga. (1); P. citrullina Chester (= Mycospherella c.). P.R. (1); P. cucurbitacearum Sacc., Ohio, Tex.

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1)

Physalospora rhodina (Berk. & Curt.) Cke., on dead stems. N.Car.

Phytophthora spp., fruit rot. P. cactorum (Leb. & Cohn) Schroet., Utah (1); P. capsici Leonian, Calif. and Colo. (1,2); P. drechsleri Tucker, Calif. (2); P. parasitica Dast., P.R. (1)

? Pseudomonas lachrymans (E.F.Sm. & Bryan) Ferr., angular leaf spot. Calif., Colo., Del., Iowa, Md., ? Mich., N.J., Pa. (1)

Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. General (1,2)

Pythium aphanidermatum (Edson) Fitz., cottony leak (fruit rot), root rot. Ariz., Calif. (1,2); Tex. (1)

P. debaryanum Hesse, damping off. Calif., Conn., Iowa, N.J., N.Y. (1)

Cucumis melo conc.-C. sativus

P. periplocum Drechs., root rot. Calif. (2)

P. ultimum Trow, damping off. Calif.

Rhizoctonia solani Kuehn, damping off, root rot. Calif., Ga., N.J., (1). Fruit rot, Fla. and Tex. (1)

Rhizopus spp., mushy soft rot, Rhizopus rot. Cosmopolitan. Chiefly R. stolonifer (Ehr. ex Fr.) Lind (R. nigricans Ehr.), sometimes R. tritici K. Saito; various other spp. have been shown potentially pathogenic.

Sclerotinia sclerotiorum (Lib.) DBy., stem rot. Ark., Mass., Tex. (1)

(Sclerotium bataticola Taub.): Macrophomina phaseoli

S. rolfsii Sacc., southern blight (in fields) Va. and Ohio to Fla. and Tex. (1), sometimes fruit rot in markets.

Septoria cucurbitacearum Sacc., leaf spot. Del., Mass., Mich., N.H., N.Y., Pa., Vt., Wis. (1)

Trichoderma viride Pers. ex Fr., green-mold rot. Minn. (1) Conidial stage of Hypocraea rufa Pers. ex Fr.

Trichothecium roseum Lk. ex Fr., pink-mold rot. Occasional in markets -- Ind., N.Y. (1); Calif. (1,2)

Verticillium albo-atrum Reinke & Berth., wilt. Calif. (1,2), Ore. (1)

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Ariz., Calif., Ida., Oreg., Tex., Utah., Wash. (1); Calif., Wash. (2)

Mosaic -- virus (in part Marmor cucumeris Holmes, Cucumis virus 1 K.M.Sm.) General (1); Ariz., Calif., N.Mex. (2). In part a special strain or perhaps different virus identified as cantaloup mosaic virus in Calif. (1,2), mild mosaic virus in New York (1) may be identical. Both are distinguished from ordinary cucumber mosaic by seed transmission in these hosts.

Ring spot -- virus (Marmor annularium McK.) Md., N.Car., Pa., Va.

CUCUMIS SATIVUS L., CUCUMBER. Annual vine of southern Asia; grown throughout the U.S., commercially for fresh market chiefly in the Gulf and Middle Atlantic States and in Calif.; also for processing in these regions and especially in Mich., Wis., Ind. and Ohio. The var. ANGLICUS Bailey, ENGLISH FORCING CUCUMBER, is occasionally grown in greenhouses.

Alternaria cucumerina (Ell. & Ev.) J.A.Elliott, leaf blight. General. A cucurbitae Letendre & Roum. as reported from Colo., Iowa, Minn., and N.J. is of doubtful status and is probably the preceding sp.

A. tenuis Nees ex Cda., seed mold. Cosmopolitan.

Ascochyta cucumis Fautr. & Roum., on leaves. Wis.

Cucumis sativus cont.

Botrytis cinerea Pers. ex Fr., gray-mold rot. Ill., Ohio, Wash.

Cercospora sp. (? C. cucurbitae Ell. & Ev.), leaf spot. Fla., Ga., Ind., Iowa, Ohio

Choanephora cucurbitarum (Berk. & Rav.) Thaxt., blossom blight. Fla., Ga.

Cladosporium cucumerinum Ell. & Arth., scab. (foliage and fruit). General, especially on greenhouse plants and on the processing crop in the North Central States.

Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. General.

Curvularia trifolii (Kauff.) Boed., seed mold. N.J.

Cuscuta gronovii Willd., dodder. N.Y.

Diplodia natalensis Pole-Evans, gray rot. Tex.

Erwinia aroideae (Town.) Holland and E. carotovorus (L.R.Jones) Holland, bacterial soft rot. Occasional in markets -- Ala., Conn., N.J., Okla., P.R.

E. tracheiphila (E.F.Sm.) Holland, bacterial wilt. General.

Erysiphe cichoracearum DC., powdery mildew. General. Identification of the powdery mildew of cucurbits, commonly found in the U.S., as this sp. rests on infection experiments with known cultures and such distinctive characteristics of the conidial stage as are known. Collections of the perithecial stage on cucumber are reported in Europe. E. polygoni DC. also has been reported but without conclusive evidence for such identification. No report of Sphaerotheca humuli (DC.) Burr. var. fuliginea (Schlecht.) Salm., as known on cucurbits in Europe, have been found in the U.S.

Fusarium spp., fruit rot. Tex. Wilt, sometimes ascribed to F. oxysporum ? f. niveum (E.F.Sm.) Snyder & Hansen, or ? f. vasinfectum (Atk.) Snyder & Hansen, but not confirmed and perhaps secondary, is occasionally reported from various localities, chiefly in greenhouses, in the North, also in the field in Calif., Mich., N.Mex., Wis.

F. solani (Mart.) App. & Wr. f. radicicola (Wr.) Snyder & Hansen, root rot. Conn., ? Ore.

Heterodera marioni (Cornu) Goodey, root knot. General in field culture from the Middle Atlantic and Central States southward and to Calif.; in greenhouse culture in the North.

Macrophomina phaseoli (Maub.) Ashby, charcoal rot (fruit) Ill.

Mycosphaerella citrullina (C.O.Sm.) Gross., gummy stem blight, black rot of fruit. Widespread, N.Y. to Fla. and Tex.; Calif., P.R.

Phyllosticta cucurbitacearum Sacc., leaf spot. Del., Ohio, Tex., P.R.

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.

Phytophthora sp., fruit rot. P.R. P. capsici Leonian, Colo.

Pseudomonas lachrymans (E.F.Sm. & Bryan) Ferr., angular leaf spot. General.

Cucumis sativus conc.

Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. General.

Pythium spp., damping off, seed rot, fruit rot (cottony leak). Spp. most active in seedling blight are identified as P. debaryanum Hesse and P. ultimum Trow, reported generally in the Eastern and Central States, in the open and under glass. Cottony leak caused by P. aphanidermatum (Edson) Fitz. is reported from Ga., La., N.J., N.&S.Car., Va., P.R.; P. anandrum Drechs. in Calif., and P. myriotylum Drechs. in S. Car., also cause fruit rot.

Rhizoctonia solani Kuehn, damping off, stem rot. Occasional, chiefly in greenhouses.

Rhizopus stolonifer (Ehr. ex Fr.) Lind, fruit rot. Occasional in markets.

Sclerotinia sclerotiorum (Lib.) DBy., stem rot, fruit rot (timber rot). Occasional in various localities, chiefly in greenhouses in the North -- Mass. to N.J., Ill., Minn. and the Pacific Northwest; in fields in Calif., Tex. and Fla.

Sclerotium rolfsii Sacc., southern blight. Va. to Fla. and Tex.

Septoria cucurbitacearum Sacc., leaf spot. Del., Mass., N.H., Pa.

Stemphylium cucurbitacearum Osner (? S. ilicis Tengwall), leaf spot. Ind., Ohio

Verticillium albo-atrum Reinke & Berth., wilt. Me., Ohio, Oreg., Wash., Wis.

Xanthomonas cucurbitae (Bryan) Dowson, bacterial spot. Mass., ? Mich.

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Calif., Ida., Oreg., Tex., Utah, Wash.

Mosaic -- virus (Marmor cucumeris Holmes, Cucumis virus 1 K.M. Sm.) Numerous strains distinguished by symptom differences in this host and by different host ranges are known. The one identified as western cucumber mosaic virus may be distinct. Cucumber also reacts with systemic chlorotic spotting to inoculation with the following viruses: alfalfa mosaic, cabbage necrotic ring, celery calico, and delphinium ringspot.

Ring spot -- virus (Marmor annularium McKinney). Md., Pa., Va.

Chlorosis -- nutrient deficiencies: Manganese -- interveinal chlorosis; Fla. Nitrogen -- leaf yellowing, attenuation and chlorosis of bud end of fruit; frequent. Potassium -- marginal bronzing and necrosis of leaves, fruit deformities; Ohio.

CUCURBITA (CUCURBITACEAE)

CUCURBITA MAXIMA Dcne., WINTER SQUASH (1) and C. MOSCHATA Dcne., CUSHAW, WINTER CROOKNECK PUMPKIN (2). Coarse annual vines of unknown nativity, grown for edible fruit which in both of these spp. is capable of storage for some time in autumn or early winter.

Alternaria sp., fruit spot, storage rot. Mass., N.H., Oreg., Vt., Wash. (1)

A. cucumerina (Ell. & Ev.) J.A.Elliott, leaf blight. N.Y., Utah (1); Tex. (2). Perhaps also Ida., Nebr., N.J. (1), reported under Macrosporium lagenariae Thuem., a name of indefinite standing.

A. tenuis Nees ex Wiltshire, seed mold. Cosmopolitan.

Ascochyta sp., leaf spot. Ore. (1)

Botrytis cinerea Pers. ex Fr., gray-mold rot. Ida., Mass., N.H., Ore., Wash. (1)

Cercospora cucurbitae Ell. & Ev., leaf spot. Del., N.J., Wis. (1); Ala., Tex. (2)

Choanephora cucurbitarum (Berk. & Rav.) Thaxt. blossom blight, blossom-end rot of fruit. N.J., R.I. (1); Okla., Tex. (1,2)

Cladosporium cucumerinum Ell. & Ev., scab, storage rot. Md., Mass., N.J., Ore., Wash. (1)

Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. N.J., N.Y., Tex.; Md., Tex. (2)

Coniosporium fairmanii Sacc., on fruit. N.Y. (1)

Diplodia natalensis Pole-Evans, gray rot. Tex. (1,2)

Erwinia carotovora (L.R.Jones) Holland, bacterial soft rot. Cosmopolitan (1,2)

E. tracheiphila (E.F.Sm.) Holland, bacterial wilt. Mass. to N.J. and Wis.; Tex., Utah (1); Tex. (2). Storage rot (?). Mass., N.H. (1)

Erysiphe cichoracearum DC., powdery mildew. General (1); Ariz., Miss., Tex. (2). See note on this sp. under Cucumis sativus.

Fusarium spp., fruit spot, storage rot. Colo., Mass., N.H., Ore., Wash., Wis. (1). F. avenaceum (Fr.) Sacc. (=F. roseum Lk. emend.Snyder & Hansen) reported in Mass.

F. oxysporum Schlecht. f. niveum (E.F.Sm.) Snyder and Hansen, wilt Ariz., N.Car. (1); Tex. (1,2). Wilt attributed to unidentified Fusarium spp., perhaps secondary following squash-borer injury, is also reported in Calif., Ill., Mich., Wis. (1).

F. solani (Mart.) App. & Wr. f. cucurbitae Snyder & Hansen, root, stem and fruit rot. Calif., ? Conn., N.Y., Ore. (1)

Gloeosporium sp., leaf spot. Ill. (1)

G. orbiculare Berk., on fruit. Mass., Nebr. (1)

Heterodera marioni (Cornu) Goodey, root knot. Calif. (1); Fla., Tex. (1,2)

Cucurbita cont.

Macrophomina phaseoli (Maub.) Ashby, charcoal rot (roots and stems). Ore. (1), Tex. (1,2)

Mycosphaerella citrullina (C.O.Sm.) Gross., gummy stem blight, black rot of fruit. Mass. (1,2); Conn., Mich., N.H., N.J., N.Y. (1)

Phoma subvelata Sacc., leaf spot, stem rot. Tex. (1)

Phyllosticta cucurbitacearum Sacc., leaf spot. Ind. (1)

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1,2)

Phytophthora cactorum (Leb. & Cohn) Schroet., fruit rot. Ariz.

P. capsici Leonian, wilt. Colo.

? Pseudomonas lachrymans (E.F.Sm. & Bryan) Ferr., angular leaf spot. Mich., N.H., N.Y. These records are doubtful since inoculation experiments indicate that squash and pumpkin are immune; perhaps confused with Xanthomonas cucurbitae

Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Me. to Ala. and Tex.; Calif. (1); La., N.Y., Tex., P.R. (2)

Pythium aphanidermatum (Edson) Fitz., root rot. Ariz.

P. debaryanum Hesse, damping off. Conn., Wis.

P. ultimum Trow, fruit rot. Calif.

Rhizoctonia solani Kuehn, root and stem rot. Tex. (1,2)

Rhizopus spp. (chiefly R. stolonifer (Ehr. ex Fr.) Lind, storage rot, usually following injuries. General.

Sclerotinia sclerotiorum (Lib.) DBy., stem rot, fruit rot. Ida., Me., Mass., Mont., N.H., N.Y., Wash. (1)

Sclerotium rolfsii Sacc., southern blight. Ala. (1)

Septoria cucurbitacearum Sacc., leaf spot. Mass., N.Y., Wis. (1)

Stemphylium sp. (? S. cucurbitacearum Osner, = S. ilicis Tengwall ?) leaf spot. N.Y. (2)

Trichothecium roseum Lk. ex Fr., pink-mold rot. Mass. (1)

Verticillium albo-atrum Reinke & Berth., wilt. Ore. (1)

Xanthomonas cucurbitae (Bryan) Dowson, bacterial spot. Ga., Md., ? Mich., N.Y. (1); Mass. (1,2)

Curly top -- virus (Chlorogenus eutetticola Holmes. Beta virus 1 K.M.Sm.). Ida., N.Mex., Oreg., Utah, Wash. (1); Calif. (1,2)

Mosaic -- virus (in part Marmor cucumeris Holmes, Cucumis virus 1 K.M.Sm.). Mass. to Fla. and Calif. (1); Fla., Tex. (2). One or more strains or related viruses affecting summer squashes in Calif. may also be involved; see Cucurbita pepo.

Yellows -- virus (Chlorogenus callistephi Holmes, Callistephus virus 1 K.M.Sm.). Me., N.H., N.Dak. (1)

Anasa wilt -- toxic effect of feeding of squash bug, Anasa tristis. N.H. (1), Utah (1,2)

CUCURBITA PEPO L., PUMPKIN, VEGETABLE MARROW, together with var. MELOPEPO (L.) (condensa Bailey), SUMMER SQUASH, BUSH S. (2); and var. OVIFERA Bailey, YELLOW-FLOWERED GOURD (3). Annual spreading (1,3) or compact (2) vines of uncertain

Cucurbita cont.
nativity (? tropical America), cult. for fruit or ornament, short-lived in storage.

Alternaria sp., fruit rot. Minn., N.J., Wash. (1); N.Y. (2)
A. cucumerina (Ell. & Ev.) J.A.Elliott, leaf blight. Minn., N.J., N.Car., W.Va. (1); Del., Utah (2)
A. radicina Meier., Drechs. & Eddy, and A. tenuis Nees ex Cda., seed mold. Occasional
Botrytis cinerea Pers. ex Fr., gray-mold rot. Tex. (1,2); Ida. (1); N.H., N.Y. (2)
Cercospora sp., leaf spot. Ind. C. citrullina Cke., Ala. C. cucurbitae Ell. & Ev., Del., Ind., W.Va. (1); Ala., Md. (3)
Choanephora cucurbitarum (Berk. & Rav.) Thaxt., blossom blight, brown rot of fruit. Me. to Fla., Tex., and Mich. (1,2). Root rot (? secondary), Md., N.J. (1)
Colletorichum lagenarium (Pass.) Ell. & Hals., anthracnose. Conn. to N.J., Tex. and Kans. (1,3); Tex. (2)
Cladosporium cucumerinum Ell. & Arth., scab, leaf spot. Md., Mass., N.Y. (2); Conn. (3)
Curvularia trifolii (Kaufm.) Boed., seed mold. Conn.
Diplodia natalensis Pole-Evans, gray rot (fruit). La., Tex.
Erwinia aroideae (Town.) Holland, and E. carotovora (L.R.Jones) Holland, bacterial soft rot. Calif., Conn., Md., Pa., Va., W.Va. (1,2)
E. tracheiphila (E.F.Sm.) Holland, bacterial wilt. General (1, 2); Conn., Mass., Nebr. (3)
Erysiphe cichoracearum DC., powdery mildew. General (1,2); Conn., Pa. (3). In American collections based on conidial stage only, but supported by infection experiments with known cultures; E. polygoni DC., as reported on this host here, is apparently based on European records.
Fusarium oxysporum Schlecht. f. niveum (E.F.Sm.) Snyder & Hansen, wilt. Ariz., N.Mex. (2). Wilt attributed to unidentified Fusarium spp. is also reported from Md., N.J. and Tex. (1); Calif. (2)
F. solani (Mart.) App. & Wr. f. cucurbitae Snyder & Hansen (F. javanicum Koord. in part), root, stem and fruit rot. Calif., N.Y. (2). Stem or fruit rot attributed to uridentified Fusarium spp. is also reported in Colo., Conn., Mass., Tex. and W.Va. (1,2); N.Y., Tex. (3)
Heterodera marioni (Cornu) Goodey, root knot. Md. to Fla. and Tex. (1,2); Ariz., Md., Tex. (2)
Macrophomina phaseoli (Maub.) Ashby, charcoal rot (roots and stems). Ore. (1,2)
Mycosphaerella citrullina (C.O.Sm.) Gross., gummy stem blight, black rot of fruit. Mass., Mich., N.J., N.Y. (1); Fla. (2); N.Y. (3); Ga., Mass. (2)
Phoma lagenariae (Thuem.) Sacc., on fruit. N.Y. (1)

Cucurbita cont.

P. subvelata Sacc., fruit spot. Tex. (3)

P. terrestris Hansen, secondary root rot. N.Dak. (1)

Phyllosticta orbicularis Ell. & Ev., leaf spot. Del., N.Y., ? Pa. (1)

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1,2)

Phytophthora spp., fruit rot. P. cactorum (Leb. & Cohn) Schroet., Ariz. (1); P. capsici Leonian, Va. (1), Mo. (2). P. citrophthora (R.E.Sm. & E.H.Sm) Leonian, Calif. (1)

Pseudomonas lachrymans (E.F.Sm. & Bryan) Ferr., angular leaf spot. Conn., ? Mich. (1,2)

Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Mass. to Va., Iowa and Wis. (1); Fla., Mass., N.Y., Va., P.R. (2); Ind., N.J., Ohio, Tex. (3)

Pythium aphanidermatum (Edson) Fitz., blossom-end rot, root rot. Calif., Md., S.Car., ? N.Y. (1,2); Ariz., Md., (2)

P. ultimum Trow, damping off, fruit rot. Calif. (1,2)

Rhizoctonia solani Kuehn, root and stem rot. Tex. (1,2)

Rhizopus stolonifer (Ehr. ex Fr.) Lind, fruit rot. Conn., N.Y., Tex. (1,2)

Sclerotinia sclerotiorum (Lib.) DBy., fruit rot. Ida. (1), Mont. (1,2), N.Y. (2).

Sclerotium rolfsii Sacc., southern blight. Fla., Ga. (1,2)

Septoria cucurbitacearum Sacc., leaf spot. Mass. (1,2)

Stemphylium cucurbitacearum Osner, leaf and stem spot. Ind., Ohio (2,3), ? N.Y. (as Sporodesmium pluriseptatum (Karst. & Hariot) Pk.); Pa. (3). S. botryosum Wallr. and S. consortiale (Thuem.) Groves & Skolko have also been reported on seed.

Xanthomonas cucurbitae (Bryan) Dowson, bacterial spot. Ill., Ind., Md., Mass., ? Conn., ? Mich. (1); ? Ga., Md., Mass., S.Car., ? Mich (2)

Curly top -- virus (Chlorogenus eutetticola Holmes). Ariz., Calif., Ida., N.Mex., Oreg., Utah, Wash. (1,2)

Mosaic -- virus (in part Marmor cucumeris Holmes, Cucumis virus 1 K.M.Sm.; in part one or more distinct strains or related viruses known as squash mosaic, cucurbit ring mosaic, and western cucumber mosaic, reported especially in Calif. but disseminated by seed elsewhere, the different types not distinguished in available records.) Probably general, reported in Eastern and Southern States; also Ariz., Calif., Colo., N.Mex., Wash. (1, 2); Ind. (3)

Ring spot -- virus (? Marmor annularium McK.) W.Va. (1)

Yellows -- virus (Chlorogenus callistephi Holmes, Callistephus virus 1 K.M.Sm.) Me. (2)

Anasa wilt -- toxic effect of feeding of squash bug, Anasa tristis. Utah (1,2)

Target spot (on fruit) -- cause unknown but Actinomyces sp., suspected. Ore. (2)

ECHINOCYSTIS (CUCURBITACEAE)

ECHINOCYSTIS LOBATA (Michx.) Torr. & Gray, MOCK-CUCUMBER (1). Annual vine occurring throughout the Central and Eastern States, south to Tex. and west to the RockyMts.; grown for ornament and screening, also of food value to wildlife. E. FABACEA Naud. (2), and E. OREGANA (Torr. & Gray) Cogn. (3), MAN-ROOT, are similar, perennial-rooted spp. of the Pacific Coast States.

Alternaria sp. (? cucumerina (Ell. & Ev.) J.A.Elliott), leaf spot. Fla. (1)
Cercospora echinocystis Ell. & G. Martin, leaf spot. N.J. to Ky., Nebr., and Wis. (1). Fruit spot, Fla., Mich. (1).
Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. Fla. (1)
Erysiphe cichoracearum DC., powdery mildew. Wis. (1)
Fusarium sp., wilt. Fla. (1)
Phleospora megarrhizae Ell. & Ev., leaf spot. Wash. (3). See Septoria m.
Plasmopara australis (Speg.) Swing., downy mildew. Iowa, Kans., Minn., Ohio, Wis. (1)
Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Ohio (1)
Septoria spp., leaf spot. S. brencklei Sacc., reported in Ill., N.Dak. on (1) may be only a growth form of S. sicyi Pk., reported in Ill., Ind., Mich., N.Dak., Wis., Wyo. (1). S. megarrhizae Ell. & Ev. is reported in Calif., Ore., Wash. (3); Phleospora megarrhizae Ell. & Ev. appears to be a growth form. S. echinocystis Ell. & Ev. is also reported in Calif. (3)

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.) Wash. (?3)
Mosaic -- virus (Marmor cucumeris Holmes, Cucumis virus 1 K.M. Sm.). Colo., Ill., Ind., Mich., N.Y., Wis. (1); Calif. (2)

LAGENARIA (CUCURBITACEAE)

LAGENARIA SICERARIA (Mol.) Standl. (L. leucantha Rusby), CALABASH, WHITE-FLOWERED GOURD. Annual vine of tropical regions, widely cult. for ornament; the dry shells of fruits used for primitive utensils.

Cercospora cucurbitae Ell. & Ev., leaf spot. Ala., Ind., P.R.
Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. Conn., Ill., Ind., Minn., Nebr., Pa.
Erysiphe cichoracearum DC., powdery mildew. Wis.
Heterodera marioni (Cornu) Goodey, root knot. Ala.
Laestadia cucurbitacearum (Cke.) Sacc., on fruit. Pa.

Lagenaria cont.
Pellicularia koleroga Cke., thread blight. Fla.
Phoma subvelata Sacc., fruit spot. Tex.
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.
Pseudomonas lachrymans (E.F.Sm. & Bryan) Carsner, angular leaf spot. Wis.
Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Conn., Fla., Mass., Ohio
? Stemphylium sp. (reported as Macrosporium lagenariae Thuem.), fruit spot. N.Y.

Mosaic -- virus (Marmor cucumeris Holmes, Cucumis virus (1) K.M. Sm.). Ind., N.Y.

LUFFA (CUCURBITACEAE)

LUFFA ACUTANGULA Roxb. (1) and L. AEGYPTIACA Mill. (L. cylindrica Roem.) (2), DISHCLOTH GOURD, VEGETABLE SPONGE. Annual vines of tropical regions, cult. for ornament and, especially (2), for the spongy fiber within the fruit, which is used for scouring.

Cercospora cucurbitae Ell. & Ev., leaf spot. Ala.
Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. Conn., (1,2); Iowa (1)
Erysiphe cichoracearum DC., powdery mildew. Conn. (1)
Heterodera marioni (Cornu) Goodey, root knot. Fla. (2)
Pellicularia koleroga Cke., thread blight. P.R.(2)
Pseudomonas lachrymans (E.F.Sm. & Bryan) Carsner, angular leaf spot. Wis.
Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Conn., Ohio, N.Car. (1); Mass., P.R. (2)

MELOTHRIA (CUCURBITACEAE)

MELOTHRIA spp. Native or introduced, trailing or climbing vines; sometimes grown for ornament, as M. SCABRA Naud. (1). Some of the native spp. furnish food for wildlife, as M. pendula L., in the Eastern and Southern States.

Erysiphe cichoracearum DC., powdery mildew. Wis.
Heterodera marioni (Cornu) Goodey, root knot. Fla. (2)
Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Ga., Ohio. (1)

MOMORDICA (CUCURBITACEAE)

MOMORDICA BALSAMINA L., BALSAM-APPLE (1) and M. CHARANTIA L., BALSAM-PEAR (2). Annual vines of tropical regions, grown for ornament and screening; (2) naturalized in Fla.

Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. Ind. (1,2)
Erysiphe cichoracearum DC., powdery mildew. Wis. (1,2)
Heterodera marioni (Cornu) Goodey, root knot. Fla. (1,2)
Pseudoperonospora cubensis (Berk. & Curt.), downy mildew. Iowa (1,2)
Ramularia momordicae Heald & Wolf, leaf blight. Tex. (1)

SECHIUM (CUCURBITACEAE)

SECHIUM EDULE (Jacq.) Sw., CHAYOTE. Vine of tropical America with perennial tuberous roots, grown in warm regions for edible fruit.

Cercospora sechii Stevenson, leaf spot. Fla., Tex., P.R.
Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. Fla., Tex.
Glomerella cingulata (Ston.) Spauld. & Schrenk, fruit rot. La.
Helminthosporium sechicola Stevenson, on leaves. P.R.
Heterodera marioni (Cornu) Goodey, root knot.
Mycosphaerella citrullina (C.O.Sm.) Gross., black rot. P.R.
Phyllosticta sechii E.Young, leaf spot. P.R.
Sclerotium rolfsii Sacc., southern blight. Tex.

SICYOS (CUCURBITACEAE)

SICYOS ANGULATUS L., BUR-CUCUMBER. Annual vine of the eastern and central U.S. and southward, sometimes grown for screening but persisting as a weed; also of food value to wildlife.

Cephaleuros virescens O.Kuntze, green scurf. P.R.
Cercospora echinocystis Ell. & G. Martin, leaf spot. Ill., N.J., Wis.
Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. Iowa
Erysiphe cichoracearum DC., powdery mildew. Wis.
Mycosphaerella sp. (Sphaerella sicyicola Ell. & Ev.), on leaves. Mo.
Phyllosticta sicyna Sacc., on leaves. N.Y.
Plasmopara australis (Speg.) Swing., downy mildew. Mass. to Mo., Nebr. and Wis.
Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew.

Sicyos cont.
Septoria sicyi Pk., leaf spot. N.Y.

Mosaic -- virus (Marmor cucumeris Holmes, Cucumis virus 1 K.M. Sm.). Mich., Wis.

SICANA (CUCURBITACEAE)

SICANA ODORIFERA Naud., CURUBA, CASSABANANA. Coarse perennial-rooted vine of S. America, sometimes grown in the Gulf States for edible fruit.

Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. Fla.

TRICHOSANTHES (CUCURBITACEAE)

TRICHOSANTHES ANGUINA L., SNAKE-GOURD. Annual vine of India, grown as a novelty for the odd shaped fruits.

Colletotrichum lagenarium (Pass.) Ell. & Hals., anthracnose. Md.
Heterodera marioni (Cornu) Goodey, root knot. ? Fla. On T. cucumeroides Maxim.
Macrophoma trichosanthis Syd., fruit spot. Ala.
Pseudoperonospora cubensis (Berk. & Curt.) Rostow., downy mildew. Mass., Ohio

End of Cucurbitaceae. The next family in this series will be Liliaceae.

DIVISION OF MYCOLOGY AND DISEASE SURVEY

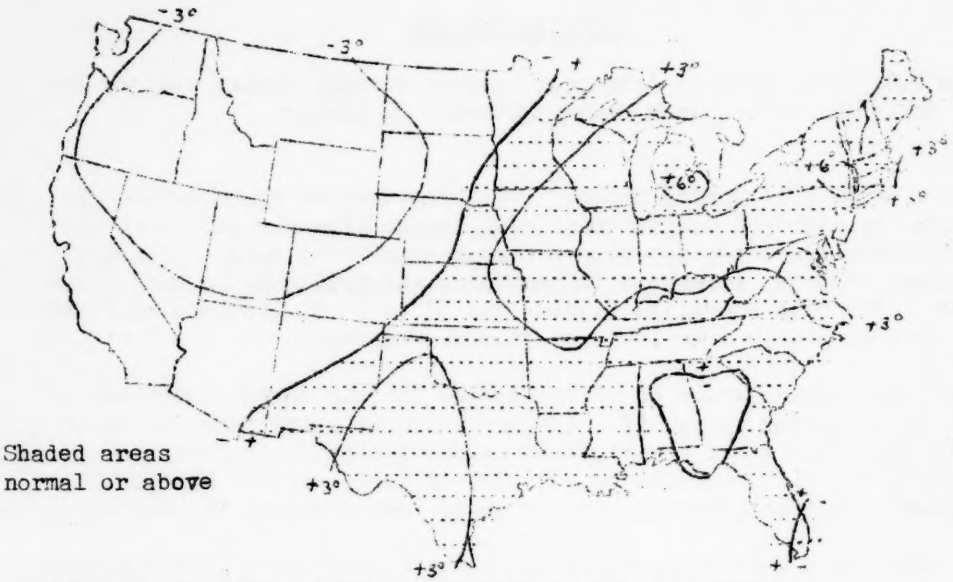
OCTOBER WEATHER

(From U.S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the week ending November 5, 1946.)

Map I shows that during October 1946, the more western portion of the country averaged cooler than usual, especially the far northwestern interior where the departures ranged from 3° to nearly 6° below the usual values. Elsewhere temperatures averaged near to much above normal. The plus anomalies ranged from 3° to 6° in sections of Texas and quite generally from Iowa and Missouri eastward over the North.

The total accumulation of precipitation for the month of October 1946, is presented by Map II. The amounts were heavy from the upper Mississippi Valley and northern and middle Plains States westward to the north Pacific coast and in sections of north-central Missouri, the Carolinas, northern Georgia, Pennsylvania, and northern New York.

Accumulations were more than 3 times their usual values in the west-central portion of the Great Plains and in the Great Basin of the far West. Less than half of the usual precipitation was received in sections of west-central Texas, east-central Gulf areas, parts of northern Michigan, and in middle and north Atlantic coastal areas.



Map I. Departure of mean temperature from the normal, October 1946

Map II. Percentage of normal precipitation, October 1946